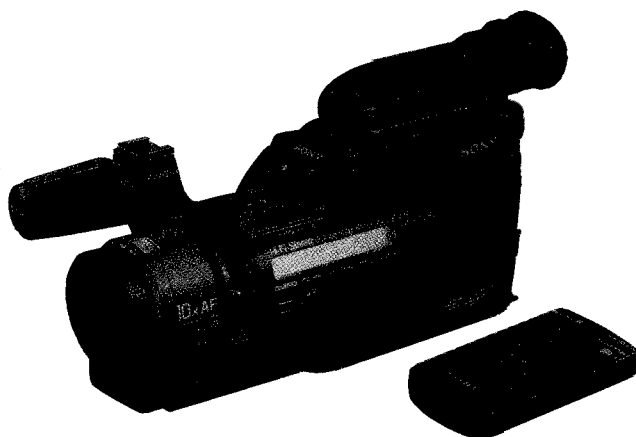


CCD-F555E

RMT-502

SERVICE MANUAL

AEP Model
UK Model
E Model
Australian Model



Video 8

U MECHANISM

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 20.051 mm/sec. LP mode: Approx. 10.058 mm/sec.
Recording/Playback time	SP mode: 1 hour 30 min. (P5-90) LP mode: 3 hours (P5-90)
Fast forward/rewind time	Approx. 6 min. 30 sec. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 10 × power zoom lens f=8.5 to 85 mm. F 1.6 with macro Filter diameter: 46 mm
Auto focus system	IR
Colour temperature	AUTO, HOLD ✱ INDOOR 3,200 K • OUTDOOR 5,800 K
Minimum illumination	3 lux (F 1.6)
Illumination range	3 lux to 100,000 lux (0.3 to 9,294 footcandles)
Recommended illumination	More than 100 lux (9 footcandles)
Aperture correction	Automatic with backlight adjustment

Input and output connector

Video output	Phono jack (1), 1 Vp-p, 75 ohms unbalanced, sync negative
Audio output	Phono jack (1), -7.5 dBs, (at output impedance less than 1 kilohm)
Video output	(Australian, E Model)/output Phono jack, 1 Vp-p. 75ohms unbalanced sync negative
Audio output	(Australian, E Model)/output Phono jack (2 : L, R), input (Australian, E Model) : -7.5dBs, input impedance more than 47 kilohms Output: -7.5dBs, (at output impedance 47 kilohms) impedance less than 1 kilohm
RFU DC OUT	Special minijack (1), 5 V DC
Headphone jack	Minijack (1), 8-ohm impedance
Remote jack	Stereo mini-minijack (1)
MIC jack	Stereo minijack, -66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

— Continued on next page —



8 VIDEO CAMERA RECORDER
SONY®

General

Power requirements

On battery mounting surface
6.0 V (battery pack)
7.5 V (AC power adaptor)
9.0 V (alkaline batteries)

Power consumption

6.9 W (camera recording)
including the viewfinder

Installation

Vertically, horizontally

Operating temperature

0°C to 40°C

Storage temperature

-20°C to +60°C

Dimensions

Approx. 111 × 140 × 347 mm
(w/h/d) (4³/₈ × 5¹/₂ × 13³/₄ in)

Weight

Approx. 1.3 kg (2 lb 12oz)
excluding the battery and cassette

Microphone

Electret condenser
microphone, stereo type

Wireless Remote Commander

Remote control system

Infrared control

Command mode

VTR2

Power requirements

3 V DC, 2 R6 (size AA) batteries

Dimensions

Approx. 57 × 20 × 120 mm (w/h/d)
(2¹/₄ × 1³/₁₆ × 4³/₄ inches)

Weight

Approx. 62g (2oz)
(excluding batteries)

Design and specifications are subject to change
without notice.

Note

This appliance conforms with EEC Directive 87/308/
EEC regarding interference suppression.

Supplied Accessories

The camcorder is packed together with the
following units. Check to see that everything
is contained in the package. (* Attached to
the camcorder)

- Remote Commander (1)
- R6 (size AA) battery for Remote
Commander (2)
- Battery pack NP-66 (1)
- AC power adaptor AC-V65A (1)
- Lithium battery CR2025 (1)
- RFU adaptor RFU-90E or RFU-89EA (1)
With the RFU-89EA, an aerial selector and
a screwdriver are supplied.
- A/V connecting cable (1)
- Plug adaptor (1)
- Cassette tape (1)
- Shoulder strap (1)
- Lens cap (1)*

SAFETY CHECK-OUT

After correcting the original service problem, perform the following
safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or
poorly-soldered connections. Check the entire
board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no
wires are "pinched" or contact high-wattage
resistors.
3. Look for unauthorized replacement parts, par-
ticularly transistors, that were installed during a
previous repair. Point them out to the customer
and recommend their replacement.
4. Look for parts which, though functioning, show
obvious signs of deterioration. Point them out
to the customer and recommend their replace-
ment.
5. Check the B+ voltage to see it is at the values
specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED
LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS
AND IN THE PARTS LIST ARE CRITICAL TO SAFE
OPERATION. REPLACE THESE COMPONENTS WITH
SONY PARTS WHOSE PART NUMBERS APPEAR AS
SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUB-
LISHED BY SONY.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

Part code and part name of the semiconductor for correction of the print board is described in the space of each print figure. Use this list when ordering parts.

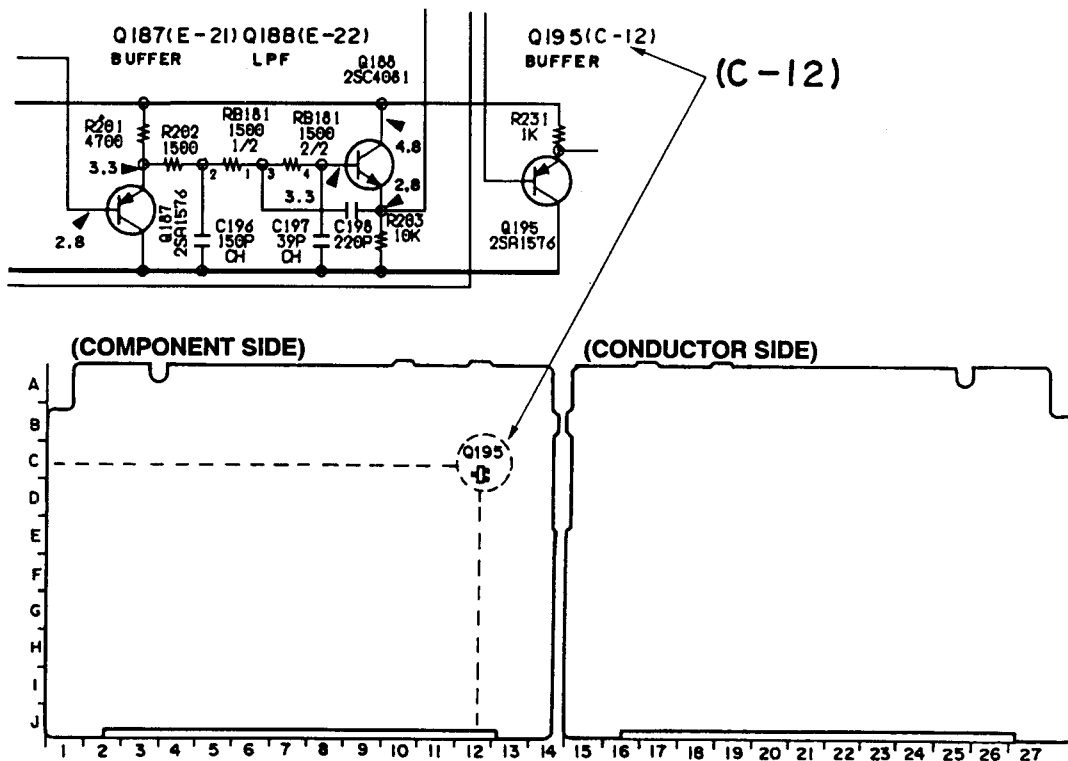
[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 98 and 160.)

This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.



[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

- ① Use a blank tape, record a short section, then press the stop button to stop.
- ② Set to recording mode again.
- ③ If the [⊗] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

- ① Play back a pre-recorded tape and display the image on a TV screen.
- ② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

- Use the Cleaning Tape V8-6CLH. (Please follow the instructions attached to the cleaning tape.)

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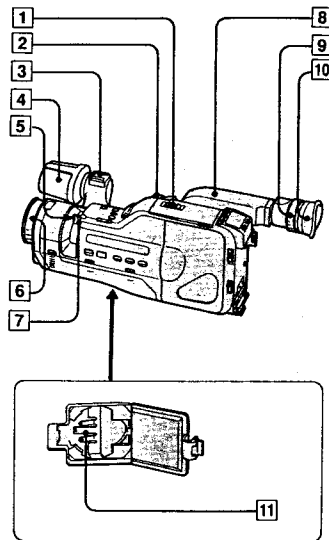
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SECTION 1 GENERAL

Identifying the Parts

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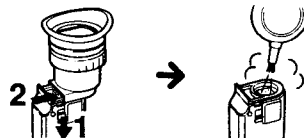


For details on the use of each control, refer to the pages indicated in the circle.

(A-1)

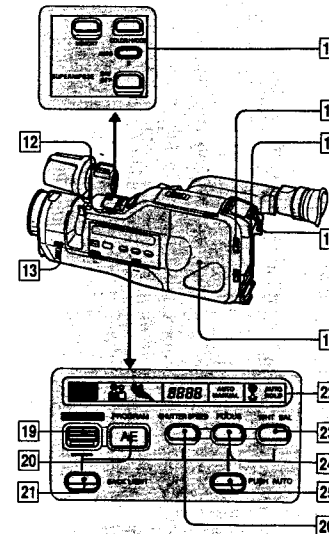
- 1 **POWER switch**
CAMERA: for camera recording
PLAYER: for playing back or editing tapes
OFF: power off
- 2 **Power zoom button** ⑤
- 3 **Accessory shoe**
Attach a video light, external microphone,
etc. (not supplied).
- 4 **Built-in microphone (stereo)**
- 5 **Macro set button**
- 6 **Lens hood (Focus ring)** ④ ⑩
- 7 **Zoom lever** ⑥
- 8 **Viewfinder**
The picture being recorded or played back
can be monitored in black and white here.
Also, marks such as caution indicators and
function mode appear here.
- 9 **Viewfinder lens adjustment ring** ⑪
- 10 **Eyecup**
- 11 **Lithium battery compartment (bottom)** ⑫

(A-2)



To remove dust from inside the viewfinder (A-2)
Detach the eyecup as illustrated and clean the surface
of the screen with a blower.

(A-3)



This section is extracted from
instruction manual.

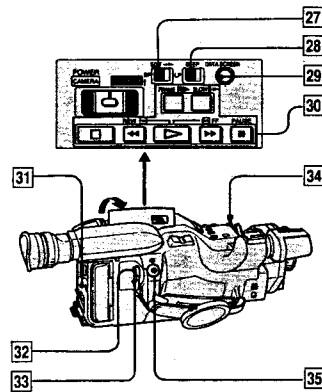
Identifying the Parts

(A-3)

- 12 **EDITSEARCH (and ③ recording review)**
button ②
- 13 **FADER button** ①
- 14 **SUPERIMPOSE buttons**
MEMORY button
COLOR/MODE button
AUTO button
SUPERIMPOSE ON/OFF button
- 15 **EJECT (cassette eject) button** ⑩
- 16 **BATT (battery eject) knob** ⑨
- 17 **Camera recording/battery lamp**
Lights up during recording and blinks when
the battery becomes weak.
- 18 **Cassette holder**
- 19 **AUTOLOCK switch** ④
When you record with automatic adjustment,
set this switch to the green position.
- 20 **PROGRAM AE (programme auto
exposure) button** ⑤ ⑥
- 21 **BACK LIGHT button** ⑧
- 22 **Display window**
- 23 **WHT BAL (white balance) button** ⑪
- 24 **FOCUS button** ③
- 25 **PUSH AUTO button** ①
- 26 **SHUTTER SPEED button** ⑦

Identifying the Parts

(A-4)



(A-4)

27 REC MODE (recording mode)/EDIT switch 22 53

Switch it depending on the operating mode.

Mode	Recording	Playback	Editing
Setting	SP LP	EDIT ←	EDIT →
Function	Recording mode switch	EDIT switch	

28 BEEP switch 22 53
Normally set to "ON" to activate the recording start/stop beeps and the warning beeps.
To deactivate the beeps, set the switch to "OFF".

29 DATA SCREEN button 53

30 Tape transport buttons 53 53
▶▶ FRAME (forward direction/frame-by-frame in forward direction)
▶ SLOW
□ (stop)
◀◀ REW (rewind)
▷ (playback)
▶▶ FF (fast-forward)
|| PAUSE

31 Battery mounting surface 13

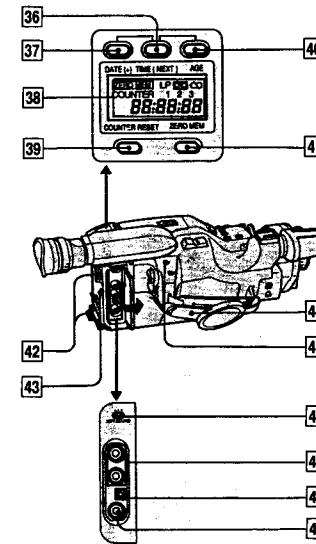
32 STANDBY switch 22
Slide up to set the camcorder to standby mode.

33 START/STOP button 22
Press to start and stop camera recording.

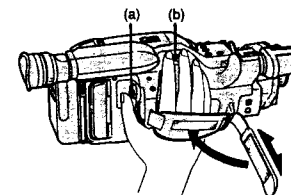
34 Camera recording/battery lamp

35 ♪ (headphones) jack (stereo minijack) 22

(A-5)



(A-5)



Identifying the Parts

(A-5)

36 TIME (NEXT) button 13 23 43

37 DATE (+) button 13 23 43

38 Display window 23

39 COUNTER RESET button 23 53

40 AGE button 53

41 ZERO MEM (zero memory) button 23 53

42 Hooks for shoulder strap

43 REMOTE COMMANDER ON/OFF switch 22
Set to "ON" when using the supplied wireless Remote Commander. When you do not use the Commander, set to "OFF" to keep the unit from being operated incorrectly by another Commander, etc.

44 Grip belt (A-6)
Adjust the length so that your thumb and fingers can easily manipulate the START/STOP button (a) and the power zoom button (b).

45 REMOTE ♪ (LANC)*control connector (stereo mini-minijack)
Connect a wired remote control unit or an editing controller, etc. here.

46 HIFI SOUND selector 53

47 AUDIO OUT (output) jacks (phono jacks)

48 RFU DC OUT (RFU adaptor DC output) jack (special minijack)
Attach the supplied RFU adaptor here.

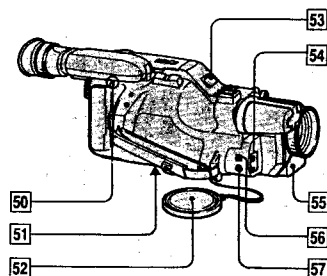
49 VIDEO OUT (output) jack (phono jack)

*About the ♪ (LANC)

♪ LANC stands for Local Application Control Bus System. The LANC connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

Identifying the Parts

(A-7)



(A-7)

50 PUSH SLIDE (viewfinder positioning) button
Slide the viewfinder to a suitable position.

51 Tripod receptacle (bottom)

52 Lens cap (A-8)

53 Remote sensor ⑩

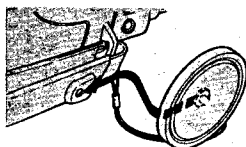
54 MIC (microphone) jack (stereo minijack) and DC OUT (power output) jack (mini-minijack)
Connect an external stereo microphone (not supplied) to record in stereo, or monaural microphone (not supplied). The MIC jack accepts a "plug-in-power" microphone and the DC OUT jack supplies power to it.

55 Infrared beam window

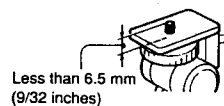
56 BUILT-IN MIC (microphone) switch ㉔
Set to "WIND" when recording in a strong wind.

57 REC START/STOP button (for low-position recording) ㉔
Use this button instead of the START/STOP button for easier low-position recording.

(A-8)



(A-9)

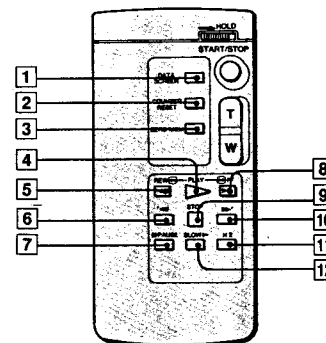


Less than 6.5 mm
(9/32 inches)

Note (A-9)

When attaching a tripod other than Sony's, make sure that the length of the camera mounting screw is less than 6.5 mm. Otherwise, the screw may damage the inner parts of the camcorder.

(A-10)



Identifying the Parts

Wireless Remote Commander

You can play back a tape from a distance. The buttons on the Remote Commander with the same name or mark as those on the camcorder have the same function.

When you use the Commander

Be sure to set the **REMOTE COMMANDER ON/OFF** switch on the camcorder to "ON", and then start operation of the camcorder, with the Commander pointing towards the remote sensor. (See "Remotely controllable area" on page 10.)

(A-10)

1 DATA SCREEN button ㉔

2 COUNTER RESET button ㉔ ㉔

3 ZERO MEM (memory) button ㉔ ㉔

4 ▷ PLAY (playback) button ㉔

5 ◀◀ REW (rewind) button ㉔ ㉔

6 ◀◀II (reverse direction/reverse frame) button*㉔

7 II PAUSE button ㉔

8 FF▶▶ (fast-forward) button ㉔ ㉔

9 □ STOP button ㉔

10 ▶▶II (forward direction/forward frame) button ㉔

11 × 2 (double speed playback) button* ㉔

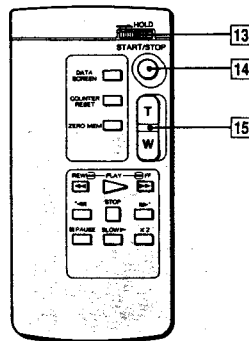
12 SLOW ▶▶ button ㉔

Note

The * indicates the functions which are operable only with the Commander.

Identifying the Parts

(A-11)



(A-11)

13 HOLD switch

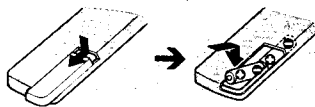
Slide in the direction of the arrow to prevent the buttons from being accidentally pressed.

14 START/STOP button

Press to start and stop camera recording.

15 Power zoom button

(A-12)



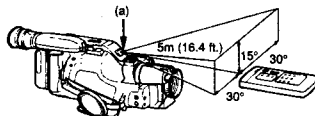
Inserting batteries (A-12)

Insert two R6 (size AA) batteries with polarity positioned correctly.

Remotely controllable area (A-13)

Point the Commander towards the remote sensor (a).

(A-13)



Note on batteries

With normal operation, batteries will last for about six months. However, if the Commander will not be used for a long period, remove the batteries to avoid possible damage from battery leakage.

Notes on the Remote Commander

- Keep the remote sensor away from the strong light source such as direct sunlight or illumination. Remote control with the Commander may not be effective.
- Be sure that there is no obstacle between the remote sensor and Commander.
- The command mode of the Commander is VTR2. Avoid to use the Sony VTRs with the same command mode at the same time.
- Be sure to set **REMOTE COMMANDER ON/OFF** on the camcorder to OFF when you connect the receiver of a remote control kit (not supplied) to the REMOTE control connector.

Preparing your camcorder 1 Connecting the Power Sources

First, Choose the Power Source.

Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-66 (supplied), NP-66H, NP-77H, NP-77 or NP-55
	Alkaline batteries	Battery case EBP-77 or EBP-55
Indoors	House current	AC power adaptor AC-V65A (supplied), AC-V30 or AC-V55
In the car	12V or 24V car battery	DC pack DCP-77, or AC power adaptor AC-V55 and car battery cord DCC-16AE

Note on power sources

Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. In this case supply the power again immediately.

Using the Battery Pack

Step 1

Charge the battery pack. (B-1)

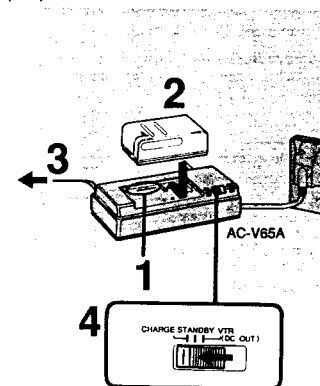
- Align the groove on the battery pack with that on the AC power adaptor.
- Slide in the battery pack to the right.
- Connect the AC power adaptor to a wall outlet.
- Set the CHARGE/VTR selector of the AC power adaptor to CHARGE. Charging begins.

	NP-66 (supplied)	NP-66H	NP-77H	NP-77	NP-55
Required charging time	80	100	140	120	60

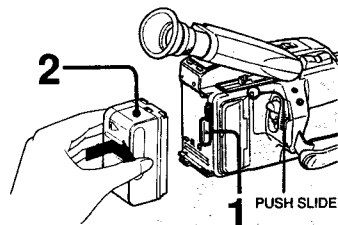
(approx. minutes using AC-V65A)

See the instruction manual of the AC power adaptor for details.

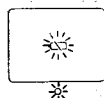
(B-1)



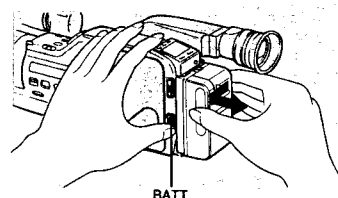
(B-2)



(B-3)



(B-4)



Connecting the Power Sources

Step 2

Mount the battery pack on the camcorder.
(B-2)

1 Align the right side of the battery pack with the white line on the camcorder.

2 Slide in the battery pack to the right.

Notes:

- Make sure the battery fits completely on the mounting surface of the camcorder. Imperfect fit may damage the projections on the camcorder.
- If your nose touches the battery pack, adjust the position of the viewfinder by sliding it while pressing PUSH SLIDE.

Battery life

A fully charged battery pack lasts for:

	NP-66 (supplied)	NP-66H	NP-77H	NP-77	NP-55
Battery life	60	70	95	80	40

(approx. minutes, continuous recording indoors)

When the battery becomes weak, the  indication and red lamp blink in the viewfinder. (B-3) Also the camera recording/battery lamps on the camcorder blink. Replace the battery pack with a fully charged one.

To remove the battery pack (B-4)

Slide BATT up, and slide out the battery pack to the left.

Other options for charging

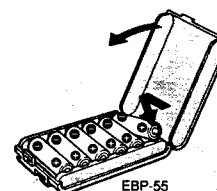
- AC-V55 AC power adaptor:
You can charge two battery packs simultaneously.
- DC-V30 car battery charger:
You can charge a battery pack by connecting the car battery charger to the cigarette lighter socket. This battery charger also supplies power to Sony 8 mm equipment that operates on a battery pack.

If you have an NP-4000

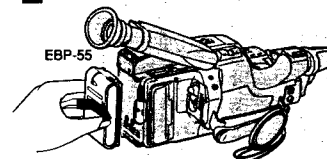
You can use it for long outdoor recording.

(B-5)

1



2



Connecting the Power Sources

Using Alkaline Batteries

(B-5)

The battery case EBP-55 or EBP-77 (not supplied) is required. And you need six R6 (size AA) alkaline batteries for EBP-55 and twelve for EBP-77.

Note:

You cannot use manganese batteries with the battery case.

1 Insert alkaline batteries into the battery case.

2 Attach the battery case in the same way as the battery pack.

Battery life (when using Sony alkaline batteries)

	EBP-77	EBP-55
Battery life	95	35

(approx. minutes, continuous recording indoors)

To remove the battery case

Remove it in the same way as you do with the battery pack. (See page 12.)

Notes on battery life

- Batteries will not last as long in cold places.
- No indication appears in the viewfinder to warn of a weak battery.

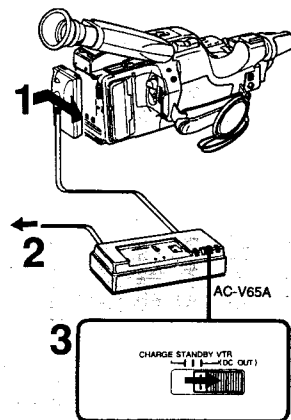
Connecting the Power Sources

Using House Current

(B-6)

Use the supplied AC-V65A AC power adaptor.

(B-6)



1 Align the right side of the connecting plate with the line on the camcorder, and slide it in to the right.

2 Connect the AC power adaptor to a wall outlet.

3 Set the CHARGE/VTR selector of the AC power adaptor to VTR.

See the instruction manual of the AC power adaptor for details.

To remove the connecting plate

Remove it in the same way as you do with the battery pack. (See page 12.)

Other options

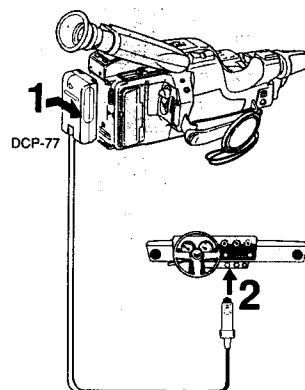
You can also use the AC-V30 or AC-V55 AC power adaptor.

Using Car Battery

(B-7)

The DCP-77 DC pack is required (not supplied).

(B-7)



1 Align the right side of the DC pack with the white line on the camcorder, and slide it in to the right.

2 Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V).

To remove the DC pack

Remove it in the same way as you do with the battery pack. (See page 12.)

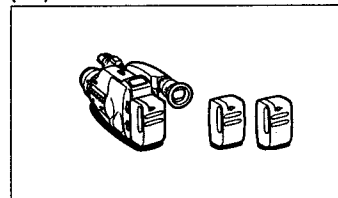
Other options

- You can also use the AC-V55 AC power adaptor and the DCC-16AE car battery cord to operate this camcorder on a 12 V or 24 V car battery.
- You can also use the DCP-55 DC pack to operate this camcorder on a 12 V or 24 V car battery.

Using the Best out of the Battery Pack

How to Prepare the Rechargeable Battery Pack

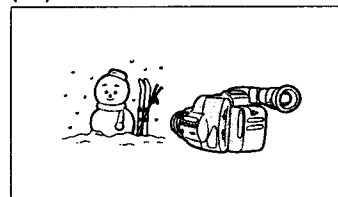
(C-1)



Have sufficient battery pack power to do 2 or 3 times as much recording than you have planned. (C-1)

"Battery life" as indicated in the instruction manual or catalogue of the camcorder is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.

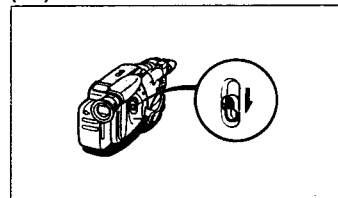
(C-2)



Battery life is shorter in a cold climate. (C-2) Battery efficiency is decreased and the battery will be used up more quickly.

Turn the **STANDBY** switch of the camcorder off when not recording to save battery power. A smooth recording can be made even if recording is stopped and started again. (C-3) While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

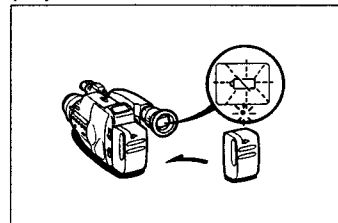
(C-3)



When the Rechargeable Battery Pack Should Be Replaced

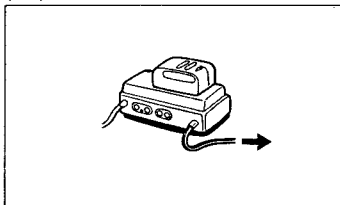
When the  mark and red lamp in the viewfinder change from slow blinking to rapid blinking while you are recording, (C-4) Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.

(C-4)



Using the Best out of the Battery Pack

(C-5)



Notes on Charging

Before using the battery pack, charge it sufficiently. A brand new battery pack is not charged.

Recharge the battery pack only when it is exhausted. (C-5)

- If recording is completed before the $\square$ mark appears in the viewfinder, it is recommended that you remove the tape, set POWER to CAMERA, slide up STANDBY, and leave the camcorder until the $\square$ mark blinks rapidly.
- **Repeated charging while some capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you fully discharge and charge the battery again.**

Recharge the battery pack before using.

If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.

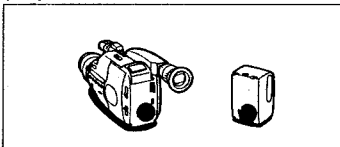
Charge it again, but in this case the battery life will be shortened than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened. (C-6)

When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also, wipe the + and - terminals with a soft cloth or paper.

(C-6)



Using the Best out of the Battery Pack

Notes on the Rechargeable Battery Pack

Why the battery pack heats up?

During charging or recording, the battery pack heats up. This means energy has been generated and chemical change has occurred inside the battery pack and this is not dangerous.

How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus, it is recommended you charge the battery before using.

How to use the switch on the battery pack (C-7)

This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

How many times can the battery pack be recharged ?

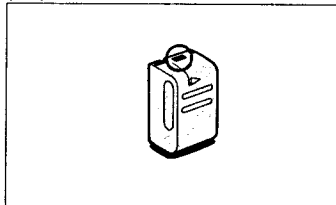
It can be fully charged and discharged about 500 times under normal temperatures.

If the $\square$ mark blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Temperatures during charging

Lower temperatures require a longer charging time. Charging under temperatures ranging from 10°C to 30°C is recommended.

(C-7)



Preparing your camcorder 2 Setting the Date and Time

Inserting the Lithium Battery

(D-1)

This camcorder uses a lithium battery to activate the clock and to keep a title and birth dates in camcorder's memory. Before operating it for the first time, install the supplied lithium battery.

- 1 Open the cover of the lithium battery compartment on the bottom.
- 2 Install the supplied CR2025 lithium battery with the + side facing out.
- 3 Close the cover.

To remove the lithium battery (D-2)
Press the side of the battery in the direction as indicated for installation.

Note on lithium battery life

The battery will last for approximately 1 year in normal operation.

When the lithium battery becomes weak, the  indication will blink on the viewfinder screen for about 5 seconds (when POWER is set to CAMERA) (D-3). In this case, **replace the battery with a Sony CR2025.**

Use of any other battery may present a risk of fire or explosion.

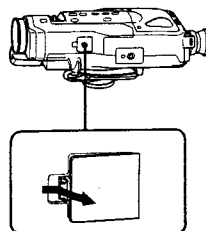
While replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, readjustments of the date, time, title and birth dates are necessary.

Cautions

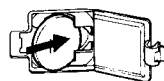
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

(D-1)

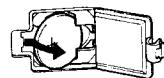
1



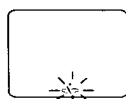
2



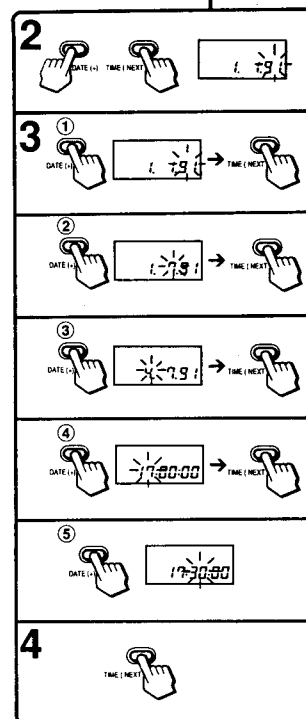
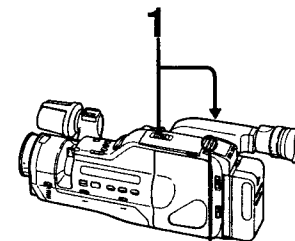
(D-2)



(D-3)



(D-4)



Setting the Date and Time

Setting the Date and Time

(D-4)

Make sure that a power source and lithium battery are attached.

- 1 Set **POWER** to **CAMERA**, and slide **STANDBY** up.
- 2 Press **DATE (+)** and **TIME (NEXT)** simultaneously for more than one and a half seconds until the date indication appears in the viewfinder.
DATE now functions as + (to advance numbers) and TIME functions as NEXT (to execute).
- 3 Adjust the year, month, day, hour and minute, in that order.
First adjust the blinking digits with +, and then press NEXT.
 - When you keep DATE (+) pressed, the digits advance faster.
 - The year starts at 1991, and proceeds as follows:
1991 → 1999 → 2000 → 2020
- 4 Press **NEXT** to set the second.
The clock starts operating.

To correct date and time setting
Repeat steps 2 to 4.

To check the preset date and time
Press DATE or TIME. When you press the same button again, the indication goes off.

Preparing your camcorder 3

Inserting a Tape

Inserting a Tape

(E-1)

- 1 Make sure that a power source is connected.
- 2 While pressing the small blue button, push EJECT in the direction of the arrow. The cassette holder opens.
- 3 Insert a tape with the window facing outside.
- 4 Press the PUSH mark to close the cassette holder.

Ejecting the Tape

- 1 Make sure that a power source is connected.
- 2 While pressing the small blue button, push EJECT in the direction of the arrow.
- 3 Take out the tape and press the PUSH mark to close the cassette holder.

Preventing Accidental Erasure

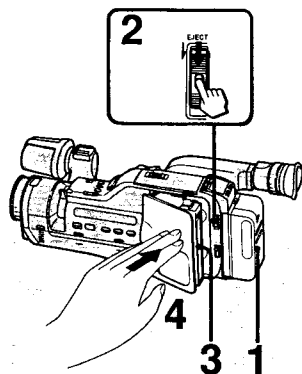
(E-2)

Slide the tab on the cassette to expose the red mark. This will prevent accidental recording. To re-record on this tape, slide the tab back out covering the red mark. If you try to record with the red mark exposed, the  and  indications blink in the viewfinder and beeps sound for about 5 seconds.

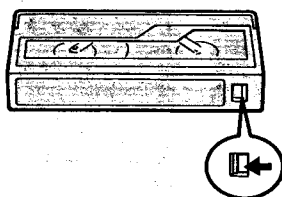
Notes on handling tapes

- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type of tape, thickness of tape, or if red mark is exposed or covered, etc.
- Store tapes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

(E-1)



(E-2)



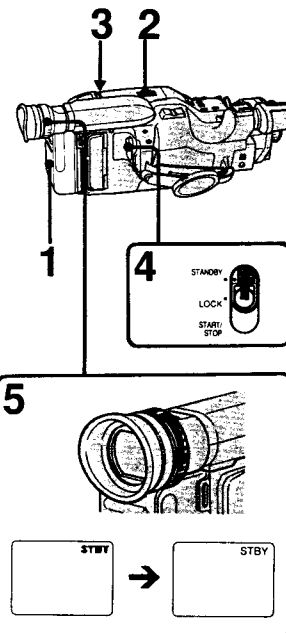
(F)

Preparing your camcorder 4

Adjusting the Viewfinder Lens

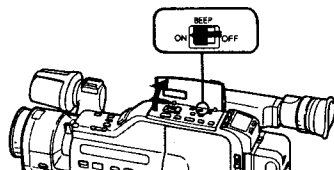
The position of the viewfinder lens for optimum vision varies depending on the person. Adjust when you use it for the first time, or when you use it after someone else did. (F)

- 1 Make sure a power source is connected.
- 2 While pressing the green button, set POWER to CAMERA.
- 3 Insert a cassette.
- 4 Slide STANDBY up.
- 5 Turn the viewfinder lens adjustment ring so that the "STBY" displayed on the viewfinder screen comes into sharp focus.

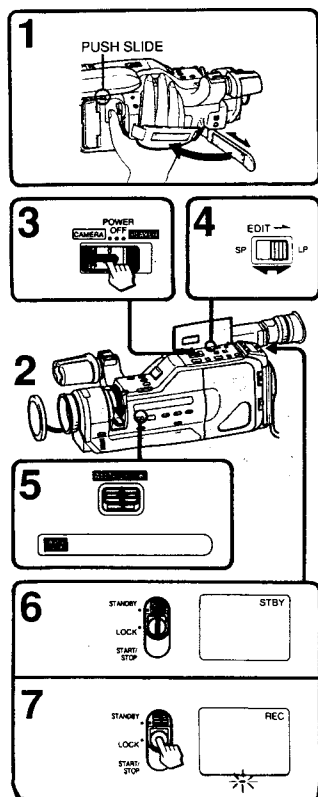


Recording a Picture Using Automatic Adjustments

(G-1)



(G-2)



Before recording "once-only" events, we strongly recommend you make a trial recording and check that everything is working perfectly.

Start Recording

Make sure BEEP is set to ON. Beep will sound when you start and stop recording. (G-1)

(G-2)

- 1 **Hold the camcorder as in the figure.**
(Put your hand through the grip belt and make sure that your finger can easily touch START/STOP.)
If your nose touches the camcorder, press PUSH SLIDE and adjust the position and angle of the viewfinder.
- 2 **Remove the lens cap and attach it to the grip strap.**
- 3 **While pressing the green button, set POWER to CAMERA.**
- 4 **Set REC MODE to LP (long play) or SP (standard play), according to the length of your planned recording.**
- 5 **Set AUTO LOCK to the green position and turn the zoom lever downwards.**
- 6 **Slide STANDBY up.**
"STBY" appears in the viewfinder. The camcorder is now in standby mode.
Focus is adjusted automatically. Do not turn or stop the focus ring forcibly.
- 7 **Press START/STOP.**
A beep sounds. "REC" appears and the red lamp lights up in the viewfinder and the camera recording/battery lamps on the camcorder light. The camcorder is now recording.

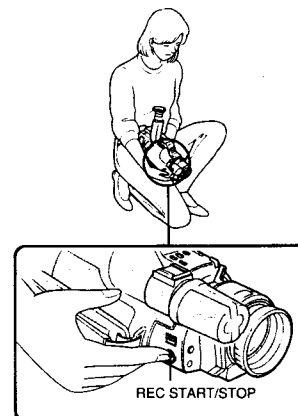
To standby (to stop momentarily)

Press START/STOP again.
Two beeps sound and "STBY" appears in the viewfinder.

To stop

Slide STANDBY down and set POWER to OFF.

(G-3)



Recording a Picture Using Automatic Adjustments

For low-position recording (G-3)

You can turn the viewfinder 90 degrees up. Press REC START/STOP in front of the camcorder.

To stop recording, press it again.

About the sports finder

This camcorder is equipped with the sports finder. As the focal length of this finder is long, you can monitor the picture while being away from the eyecup.

Using the BEEP switch

Normally set BEEP to ON.

It beeps once when you start and twice when you stop recording. And it beeps several times as a warning, if any difficulty should arise during operation. If you want to deactivate the beeps, set BEEP to OFF.

Notes

- Beeps are not recorded on the tape.
- For warning beeps, see the back cover.

If the tape reaches near the end during recording

The  indication in the viewfinder and the camera recording/battery lamps on the camcorder blink slowly.

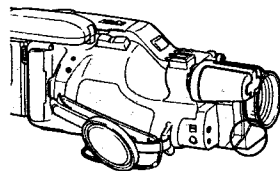
When the tape reaches its end, blinking becomes rapid and beeps sound for about 5 seconds (if BEEP is set to ON).

Notes on recording

- To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- When moving from indoors to outdoors, or vice versa, slide STANDBY up and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.

Recording a Picture Using Automatic Adjustments

(G-4)



Notes on automatic recording (G-4)

- During recording, do not cover the infrared beam window.
- Keep the lens and the infrared beam window clean.

Note on standby

If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume standby mode, slide STANDBY down once and slide it up again.

Note on the microphone

The microphone is fixed to the camcorder. Do not turn the microphone or hold the camcorder by the microphone. This may damage the camcorder.

Note on light sources

If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to the other direction.

(G-5)



(G-5)

Auto focusing system of this camcorder

This camcorder adjusts focus automatically by emitting an infrared beam at the objects to be shot and then detecting the reflected beam. When the subject is approximately 3 meters (10 ft.) away from the camcorder, the focus is sharpest in the center of the screen. The camcorder has the tendency, however, to focus a bit lower to the right when the subject is within 3 meters, and a bit higher to the left when the subject is more than 3 meters away.

Recording mode

An 8 mm video format cassette records in the SP (standard play) mode and in the LP (long play) mode and can play back in the SP mode and LP mode.

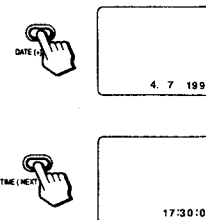
The quality of the recording picture in the LP mode, however, will not be as good as that in the SP mode.

Note on PCM recording and playback

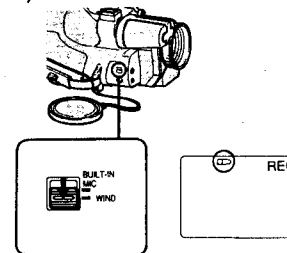
PCM recording or playback is not possible with this camcorder.

The PCM sound recorded or after-recorded with another video recorder cannot be played back with this camcorder.

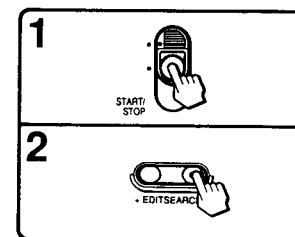
(G-6)



(G-7)



(G-8)



Recording a Picture Using Automatic Adjustments

To Record the Date or Time

(G-6)

During camera recording or when in standby mode, press DATE for date indication or TIME for time indication.

The date or time displayed in the viewfinder is recorded with the picture.

To stop recording date or time

Press DATE or TIME again.

The picture recording continues.

When There is a Strong Wind

(G-7)

Set BUILT-IN MIC to WIND.

The noise from the wind will reduce.

After recording, set it to the upper position (green mark).

To Check the Last Portion of the Previous Recording

(G-8)

1 Set the camcorder in standby mode by pressing the START/STOP button.

2 Press the – side of EDITSEARCH (Ⓢ) momentarily.

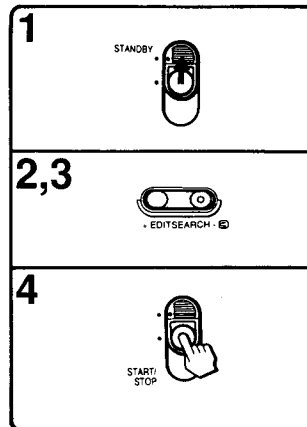
The last few seconds of the recorded portion are rewound and then the recorded picture appears in the viewfinder. After a few seconds of playback, the camcorder goes back to standby mode.

If the picture has not been recorded

The video heads may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette or equivalent.

Recording a Picture Using Automatic Adjustments

(G-9)



To Re-record on a Previously Recorded Portion during Recording

(G-9)

1 Slide STANDBY up.

2 Look in the viewfinder and find the point from where you want to begin the recording:
Keep pressing the + side of EDITSEARCH to advance the picture at a normal playback speed, or the - side to reverse the picture.

3 At the desired point, release EDITSEARCH.

4 Press START/STOP.
A beep sounds and the recording begins.

To pause

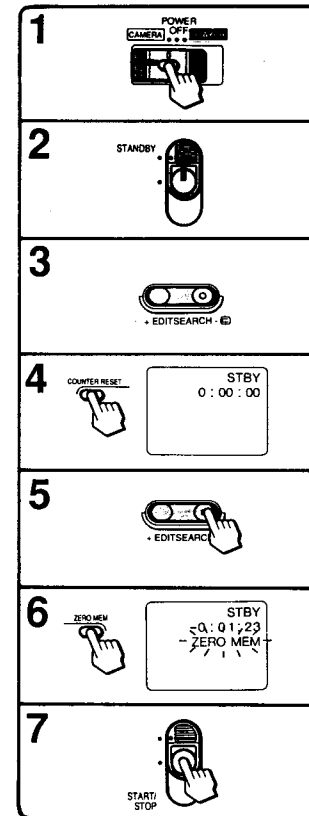
Press START/STOP again.

To stop

Slide STANDBY down.

A smooth transition between scenes can be made even if STANDBY is slid down and slid up, or even if the power is turned off and on again, provided that the tape is not removed.

(G-10)



Recording a Picture Using Automatic Adjustments

To Re-record a Picture in the Middle of a Recorded Tape (Insert Recording)

(G-10)

1 While pressing the green button, set POWER to CAMERA.

2 Slide STANDBY up to set the camcorder to standby mode.

3 While looking in the viewfinder, keep pressing the + or - side of EDITSEARCH and release the button where you want to end the insertion.
The camcorder is set to standby mode.

4 Press COUNTER RESET.
The counter is reset to zero.

5 While looking in the viewfinder, keep pressing the - side of EDITSEARCH and release the button at the point where you want to start the insertion.

6 Press ZERO MEM.
The insert ending point is stored in memory.

7 Press START/STOP.
A beep sounds and insert recording begins.
The insert recording stops automatically near the counter zero point.

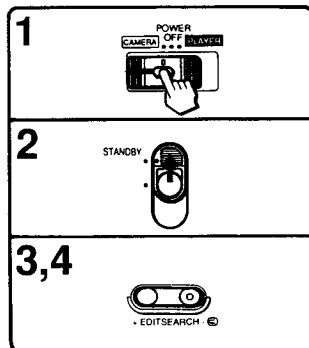
To cancel the ZERO MEM
Press ZERO MEM.

Note

The picture may be distorted at the ending point when played back.

Recording a Picture Using Automatic Adjustments

(G-11)



Playing Back Your Picture Instantly

(G-11)

You can check the recorded picture in the viewfinder. However, you cannot monitor the sound.

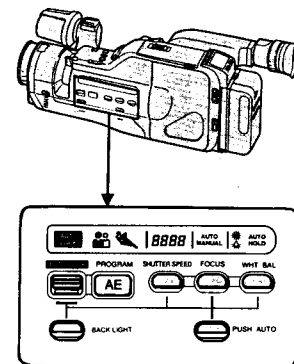
- 1 While pressing the green button, set POWER to CAMERA.
- 2 Slide STANDBY up.
- 3 Keep pressing the - side of EDITSEARCH to view the playback picture in reverse.
- 4 Keep pressing the + side of EDITSEARCH to view the playback picture.

To stop playback, release EDITSEARCH.

To monitor the sound while viewing the playback picture in the viewfinder

1. Connect the headphones to the 1/4" jack.
2. While pressing the green button, set POWER to PLAYER.
3. Press ◀ to rewind the tape and press □ where you want to stop.
4. Press ▶ to start playback.

(H)



Selecting the Automatic/Manual Adjustment

When you set AUTO LOCK to the green position, focus, white balance, and iris are adjusted automatically and the shutter speed is set to 1/50. The automatic function offers you worry-free operation under most shooting conditions. But under certain circumstances, manual adjustment is better for effective recording. For manual adjustment, set AUTO LOCK to the lower position and select an appropriate setting. (H)

To adjust each item manually, see the page as shown in the table.

Item	See page
Focus	30
White balance	32
Shutter speed	34
Back light	35

PROGRAM AE function:

In addition to the above items, when you use the PROGRAM AE (Auto Exposure) function under the manual mode, you can get a scene like a portrait or clear picture in the still and slow motion playback. (See pages 36 and 37.)

Push Auto:

During recording with manual focusing, as long as you keep this button pressed, autofocus is activated.

When you attach the battery at the first time

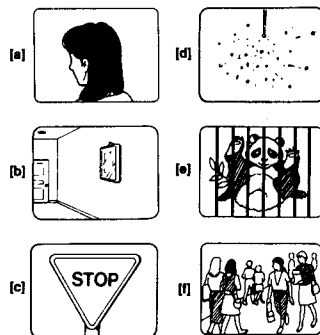
The white balance, focus and iris are automatically adjusted and the shutter speed is set to normal speed (1/50) regardless of the position of AUTO LOCK.

Notes

- As long as you do not remove the battery, even if you set POWER to OFF, the previous settings are stored.
- If you set AUTO LOCK to the green position after you have made a manual adjustment and reset it to the lower position, the previous settings for manual adjustment will be later recalled.

Manual Focusing

(I-1)



When you set AUTO LOCK to the green position, the autofocus functions and you can easily get a focused picture under most shooting conditions. However manual focusing is recommended in the following cases. [a] to [f] correspond to the illustrations. (I-1)

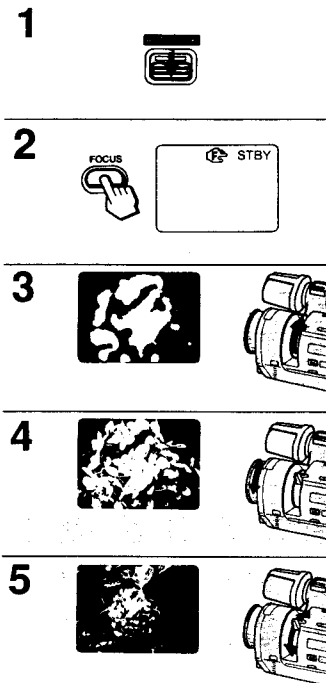
- [a] Black objects which absorb the infrared beam**
Ex. dark curtains or shade
- [b] Objects in which the infrared reflection disperses**
Ex. a smooth standing surface (Autofocusing functions when the camcorder is aimed squarely at the subject.)
- [c] Objects in which the infrared beam is reflected too much**
Ex. traffic signs, a white wall, a mirror, or a subject through plate glass
- [d] Objects not solid**
Ex. fireworks, candle flame or smoke
- [e] When there are other objects between the shooting object and this camcorder**
Ex. an animal inside a cage or baby inside a cot
- [f] Moving objects**
Ex. a crowd or sports with lots of movement

- **Objects which emit infrared beams themselves**
Ex. automatic doors, fluorescent lights, TV or VCR Remote Commander, or another Commander that uses an infrared beam for auto focusing.
- **Objects more than 20 meters (65 feet) away from the camcorder**
Especially with an overcast day, or at night.

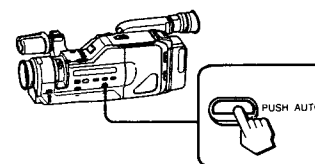
The autofocus does not function momentarily in the following cases:

- When the camcorder is rapidly panned from a distant subject to a nearby subject.
- When you are shooting fast moving objects.

(I-2)



(I-3)



Manual Focusing

Focusing Manually

(I-2)

- 1 Set AUTO LOCK to the lower position.**
- 2 Press FOCUS.**
Make sure the (manual focusing) indication appears in the viewfinder.
- 3 Turn the manual zoom lever fully to the telephoto position.**
- 4 Turn the focus ring to achieve sharp focus.**
- 5 Set the desired shot length using the manual zoom lever.**

Shooting with autofocus momentarily

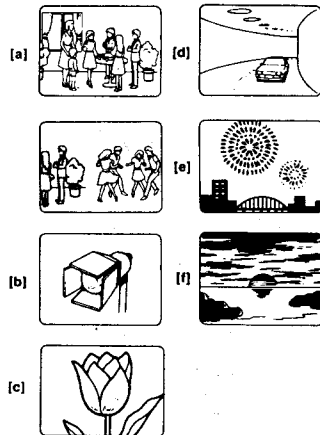
(I-3)

While shooting with manual focusing, press PUSH AUTO. The autofocus functions while you are pressing the button. When you release the button, manual focusing will be resumed. Use this button when you change the focus from one subject to another. The focusing performs naturally. The previous settings except for focusing are retained.

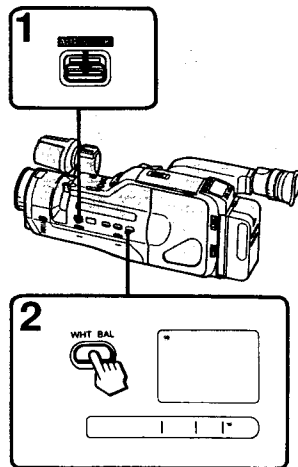
Some helpful hints

- When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles after focusing in telephoto.
- When shooting a scene with lots of movement in bright light, set the zoom lever to the wide-angle position and the focus ring to 2 to 3 m (6.5 to 10 ft.).

(J-1)



(J-2)



Adjusting the White Balance

When you set AUTO LOCK to the green position, the auto white balance function of this camcorder adjusts the picture to natural colours under most shooting conditions. However, in the conditions listed below, adjust the white balance manually.

[a] to [f] correspond to the illustrations. (J-1)

Conditions	Indication in the viewfinder
[a] Lighting conditions change quickly	☆
[b] Too bright, such as in photograph studios	☆
[c] Monochromatic subject or background	HOLD
[d] Under a sodium lamp Under a mercury lamp Under a colour matching fluorescent lamp	☆
[e] Recording outdoors: a night view, neon signs or fireworks	*
[f] Recording outdoors: scenes after sunset or before sunrise	

Adjusting the White Balance Manually

(J-2)

- 1 Set AUTO LOCK to the lower position.
- 2 Select the desired white balance mode by pressing WHT BAL.
Each time you press the button, the indication changes as follows.

→ No indication → HOLD → ☆ → *

Note on manual adjustment

When moving from indoors to outdoors, or vice versa, set AUTO LOCK to the green position and then reset to the lower position again.

Adjusting the White Balance

What is the HOLD mode?

In the HOLD mode, the camcorder automatically adjusts to the colour temperature of the subject's light source and keeps that temperature during recording. When recording some subjects with different colour temperatures, use the HOLD mode to set a colour temperature and you can achieve a recording with natural colours without being affected by the surroundings.

To set into the HOLD mode

- 1 Set AUTO LOCK to the lower position and press WHT BAL to set to Auto (no indication).
- 2 Point at and record a white, flat object such as a white wall, or paper.
- 3 Press WHT BAL.
The HOLD mark appears in the viewfinder.

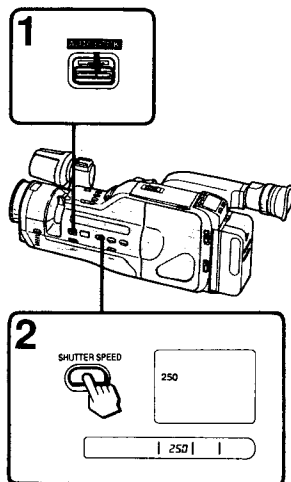
When you change the battery pack or the light source is changed, you need to set to the HOLD mode again. In this case, follow the procedures above again.

Setting Shutter Speed

(K-1)



(K-2)



(K-1)

When you record a fast-moving subject, increase the shutter speed so that you can see the clear picture in the playback pause mode. Also, the depth of field in proper focus becomes shallow at a high shutter speed. This is effective to record the main subject in sharp focus and the surroundings of focus. When recording at a high-speed shutter setting, record in a brighter place than usual.

Recommended setting for your situation

Example use	Recommended shutter speed
- On clear days, recording golf or tennis swing (To view the hit ball clearly in the still picture mode, set to 1/4000.) - Recording skiers	1/4000 or 1/2000
- On overcast days, recording a moving merry-go-round or roller coaster - Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
- Instead of the ND2 filter (To reduce the exposure level to about a half) - Recording indoor sports (for stable shooting)	1/120

Selecting the Shutter Speed

(K-2)

- 1 Set AUTO LOCK to the lower position.
- 2 Press SHUTTER SPEED repeatedly until the desired shutter speed indication appears.

Each time you press the button, the indication changes as follows.

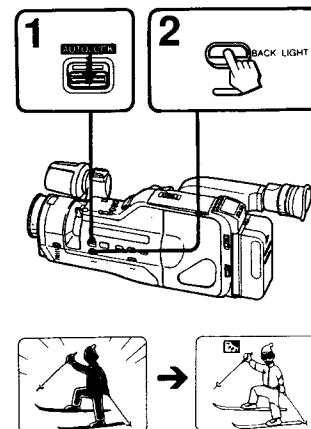
No indication (1/50) → 120 (1/120) → 250 (1/250) → 4000 (1/4000) ← 2000 (1/2000) ← 1000 (1/1000)

Notes

- When you select shutter speed 1/250 or faster, record under sunlight or use a video light.
- When you shoot a very bright subject at a faster shutter speed, a light vertical, belt-like line ("smear") may appear on the screen.
- When you record at certain shutter speeds under a light discharged tube, such as a fluorescent lamp, sodium lamp or mercury lamp, the brightness of the recorded picture may vary.

Shooting with Backlighting

(L)



In this camcorder, the iris is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button. (L)

- 1 Set AUTO LOCK to the lower position.
- 2 Press BACK LIGHT. The indication appears.

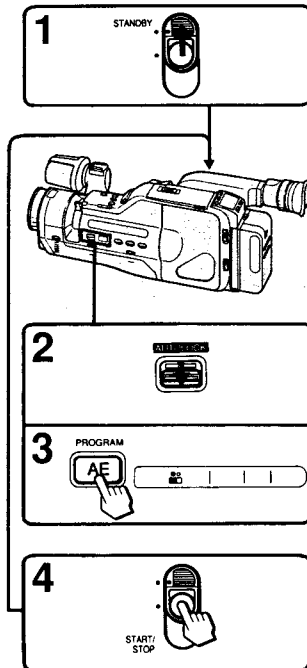
After shooting, be sure to release this adjustment condition by pressing BACK LIGHT again. (The indication goes out.) Otherwise, the recorded picture will become too bright.

Using the PROGRAM AE button

(M-1)



(M-2)



Using the Portrait Mode

(M-1)

In the portrait mode, the object is in focus and the background is out of focus. The opening of the iris and the shutter speed is automatically adjusted to maintain the appropriate exposure according to the size and brightness of the object. The portrait mode is most effective to be used outdoors.

Use the portrait mode when shooting the following subjects:

- a still subject such as person or flower
- zooming in a subject in the telephoto mode
- subjects beyond obstacles such as net

How to set to portrait mode (M-2)

- 1 Slide STANDBY up.
- 2 Set AUTO LOCK to the lower position.
- 3 Press PROGRAM AE until appears in the display window.
- 4 Press START/STOP.
Recording with the portrait mode starts.

To resume the automatic mode

Press PROGRAM AE until neither nor appears in the display window or set AUTO LOCK to the green position.

Hint for effective camera work

Use of the portrait mode in the following method will gradually bring the background out of focus while keeping the object in focus.

- 1 Enter the portrait mode.
- 2 Set AUTO LOCK to the green position and start recording.
- 3 Set AUTO LOCK to the lower position.
The camcorder will enter the portrait mode and bring the background out of focus.

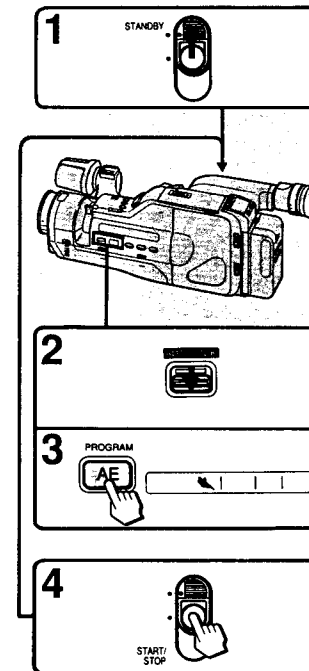
Note

When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may flicker, or the colour of the recorded picture may become unnatural.

(M-3)



(M-4)



Using the PROGRAM AE button

Using the Sports Mode

(M-3)

In the sports mode, the shutter speed and the opening of the iris are automatically adjusted to maintain the appropriate exposure according to the speed of the object. An object moving in high speed can be recorded and the picture can be observed more clearly with less picture shaking in the still or slow mode. The sports mode provides more effective recording than you can achieve by using SHUTTER SPEED.

You may want to use the sports mode when shooting the following subjects:

- outdoor sports scene such as football, tennis, or golf
- recording a landscape in the running car

How to set to sports mode (M-4)

- 1 Slide STANDBY up.
- 2 Set AUTO LOCK to the lower position.
- 3 Press PROGRAM AE until appears in the display window.
- 4 Press START/STOP.
Recording with the sports mode starts.

To resume the automatic mode

Press PROGRAM AE until neither nor appears in the display window or set AUTO LOCK to the green position.

Hint for effective camera work

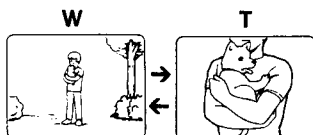
When shooting athletic matches from a distant, such as a football game, we tend to zoom from the wide to the telephoto position to catch the once-only events. Even under these circumstances, by using the sports mode, a sharp picture can be obtained when played back later in the slow or still mode.

Notes

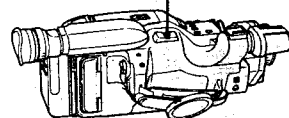
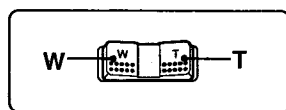
- The sports mode is effective under sufficient lighting, such as under sunlight. When used under extremely dark conditions, the shutter speed may not be shifted to high speeds.
- When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may vary, or the colour of the recorded picture may become unnatural.

Zooming

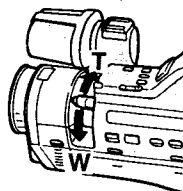
(N-1)



(N-2)



(N-3)



You can change the size of the subject in the scene. Use "zoom-in" for dramatic close-ups. Use "zoom-out" for panoramic long shots. Also use zooming to focus manually or to decide the shooting angle. (N-1)

Power Zooming

— for smooth and constant zooming (N-2)

Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

The zooming speed is faster when the power zoom button is pressed firmly, and slower when the button is pressed lightly.

Zooming Manually

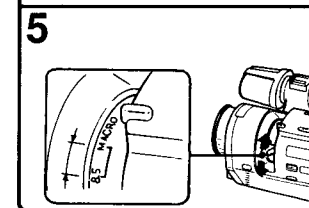
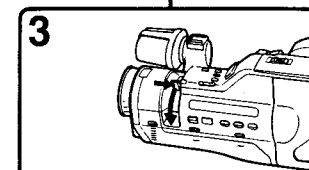
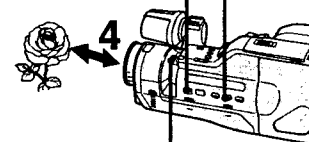
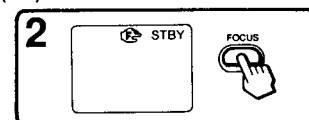
— for creating a dramatic effect (N-3)

Turn the manual zoom lever upward for telephoto and downward for wide-angle.

Focal length of this camcorder

The focal length is 8.5 mm to 85 mm. This means approximately 46 mm to 460 mm converted into the focal length of a 35-mm still camera.

(O-1)



Close-up (Macro)

Even small subjects, such as flowers, insects, images in photographs, can literally fill the screen with macro shooting. (O-1)

1 Set AUTO LOCK to the lower position.

2 Press FOCUS to set the manual focusing.
The  indication appears in the viewfinder.

3 Turn the zoom lever to the MACRO position, pressing the green macro set button.

4 Bring the camcorder as close as necessary to obtain the desired size of image.
The subject can be as close as a minimum of 10 mm (7/16 in.) from the lens surface.

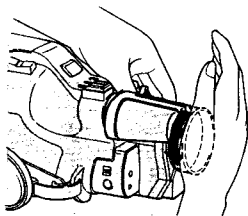
5 Turn the zoom lever within the MACRO range to focus sharply.

Notes

- Autofocusing does not function in macro shooting.
- If the object is closer than 10 mm (7/16 in.), it cannot be brought in focus.

Close-up (Macro)

(O-2)



If the lens hood touches the subject

Remove the lens hood.
Hold the focus ring and turn the hood by pressing it with your palm. (O-2)
Do the same when attaching/removing an optional filter or conversion lens.

When you cannot come close to the object

You can record a close-up picture between 0.75 to 1.3 m (2.5 to 4 ft.) away from the object.
Turn the zoom lever to the telephoto end position (85).

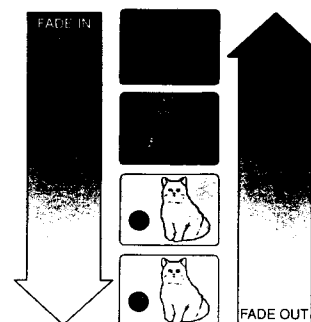
Note

You need enough lighting to shoot a title card, etc. when you shoot indoors.

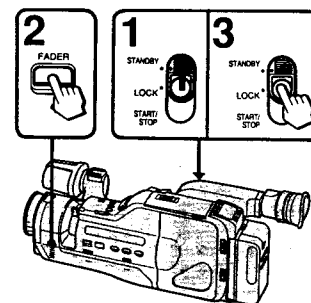
Recommended accessory

When shooting in macro, the depth of field is very shallow, so pay attention to focusing. To keep the subject in focus, use a tripod.

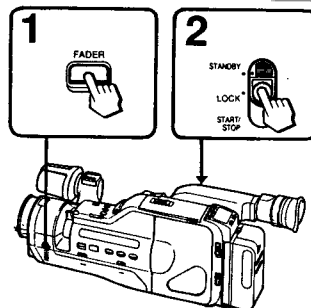
(P-1)



(P-2)



(P-3)



Fade-in and Fade-out

You can fade-in or fade-out to give your recording a professional appearance.
When fading-in, the picture will gradually appear from black. The sound will also gradually increase.
When fading-out, the picture will gradually fade to black. The sound will gradually decrease.
(P-1)

To Fade-in

(P-2)

- 1 Slide **STANDBY** up to set the camcorder in the standby mode.
- 2 Press **FADER**.
- 3 Press **START/STOP**.
Fade-in is performed and recording will start.

To Fade-out

(P-3)

- 1 While recording, press **FADER**.
- 2 Press **START/STOP** to stop the recording.
Fade-out is performed and then recording stops.

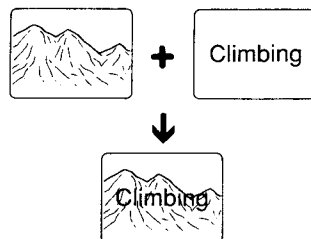
To cancel the fade-in/fade-out function
Before pressing **START/STOP**, press **FADER** again.

If you want to use the fade-in/fade-out function repeatedly
Start from step 1 each time.

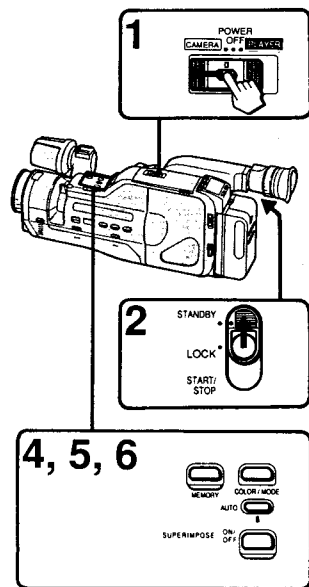
When the title (page 42), date/time (page 25) or age (page 50) is displayed
The title, date/time or age does not fade-in or fade-out.

Superimposing a Title

(Q-1)



(Q-2)



You can superimpose your own hand-written message or graphics (title) over the picture during recording or playback (editing). (Q-1)

Before recording, store a title.

Storing a Title (Q-2)

Before storing

- Make a desired title card.
Use a plain, white card and draw a title with a dark colour in thick letters.
- You can choose from 8 colours for your title.
- Make sure the lithium battery is installed.
(page 18)

How to store

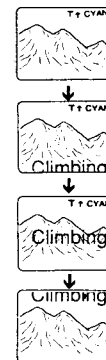
- 1 While pressing the green button, set POWER to CAMERA.
- 2 Slide STANDBY up to set the camcorder in the standby mode.
- 3 Point the camcorder to the title card and adjust the focus.
To focus the subject, use the close-up function. (page 39)
- 4 Press MEMORY to store the title.
- 5 Press COLOR/MODE and select the title colour.
Each time you press the button, the indication changes as follows.
WHT (white) → BLUE → GRN (green) → CYAN → RED
BLK (black) ← YEL (yellow) ← VIO (violet) ←
- 6 Press SUPERIMPOSE ON/OFF to turn off the title.

To check the title

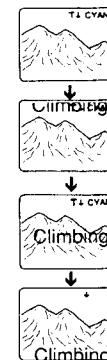
Press SUPERIMPOSE ON/OFF in the standby mode.

To turn off the title, press the button again.

(Q-3)



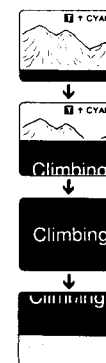
(Q-4)



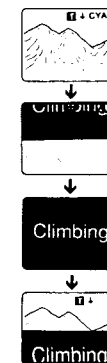
(Q-5)



(Q-6)



(Q-7)



Superimposing a Title

Various Display Modes of the Title

You can scroll your title up or down, or reverse the title.
Select the display mode of the title from the following table.

Display mode	Indication in the viewfinder
Scrolling up the title (Q-3) The title scrolls up and stops at the center.	↑
Scrolling down the title (Q-4) The title scrolls down and stops at the center.	↓
Reversing the title with the picture (Q-5)	↕
Scrolling up the reversed title (Q-6)	↕↑
Scrolling down the reversed title (Q-7)	↕↓
Normal display mode	No indication
Auto-superimposing	⏻ AUTO

Note on scrolling

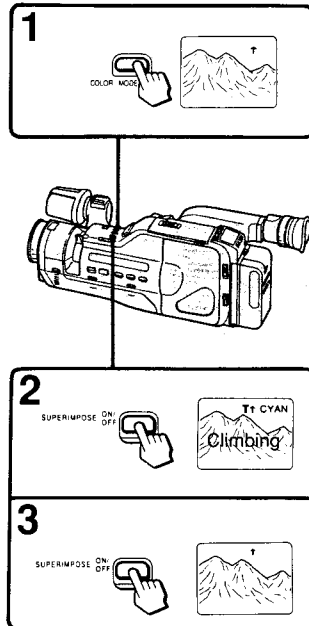
You can scroll the title only when the camcorder is in the recording standby, recording, or normal playback mode. In the other modes (see "Playing Back a Tape" on page 56), you can select only reversing (↕) or normal display mode. Also scrolling will be cancelled when you set the camcorder in the other modes after selecting scrolling.

About memory back-up

The camcorder uses the lithium battery on the bottom to keep the title in memory. The lithium battery life is approximately one year.

Superimposing a Title

(Q-8)



Superimposing a Title on Your Tape

The following shows how to superimpose a title using an example in which the title in cyan scrolls up. (Q-8)

- 1 Press COLOR/MODE to select the display mode of the title in the standby or playback pause mode.
- 2 Press SUPERIMPOSE ON/OFF at the point from which you want to insert the title in the standby mode, during recording, in the playback pause mode or during playback.
You can change the title colour by pressing COLOR/MODE.
Each time you press the button, the colour indication changes.
- 3 Wait for a while and press SUPERIMPOSE ON/OFF again.
The title goes out.

About the colour and the display mode indications
The colour and the display mode indications in the viewfinder are not recorded.

If you press EDITSEARCH in standby mode
The title goes out. After performing the editsearch or recording review function, the title appears again.

If you want to record the title during playback
Make connections for editing and record the title on another VTR. (See page 59.)

(Q-9)



Superimposing a Title

Function of the COLOR/MODE button

This button has a double function: one is to select the title colour and the other is to select the title display mode.
Its function depends on if the title is displayed or not. (Q-9)

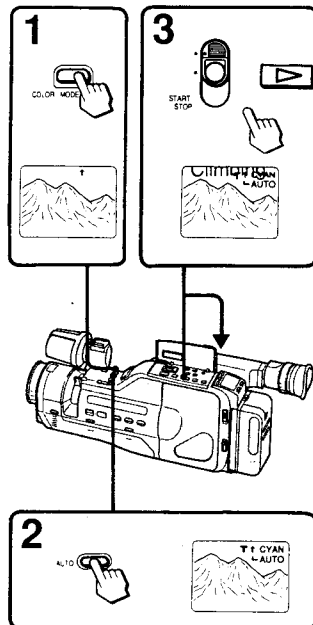
To select the colour

- 1 Press SUPERIMPOSE ON/OFF to display the title.
- 2 Press COLOR/MODE.
Each time you press the button, the colour indication changes as follows:
WHT (white) → BLUE → GRN (green) → CYAN → RED
BLK (black) ← YEL (yellow) ← VIO (violet) ←

To select the display mode

- 1 If the title is displayed, press SUPERIMPOSE ON/OFF so that the title disappears.
- 2 Press COLOR/MODE.
Each time you press the button, the display mode indication changes as follows:
No indication (normal mode) → ↑
↑↓ ← □↑ ← □ ← ↓ ←
↑ : Title scroll up mode
↓ : Title scroll down mode
□ : Title reverse mode
□↑ : Title reverse and scroll up mode
□↓ : Title reverse and scroll down mode

(Q-10)



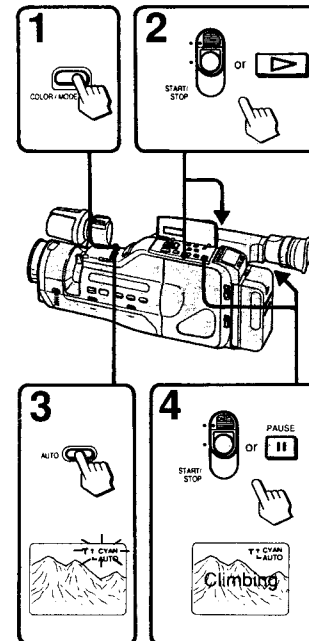
Superimposing a Title

Superimposing a Title at the Beginning

You can clear the title automatically after displaying it for a few seconds. (Auto-superimposing) (Q-10)

- 1 Press COLOR/MODE to select the display mode of the title in the standby or playback pause mode.**
- 2 Press AUTO.**
- 3 Start recording or playback.**
The title is displayed in the selected mode and disappears after a few seconds.

(Q-11)



Superimposing a Title

Superimposing a Title Before the Tape Stops

You can display the title automatically for a few seconds after you press START/STOP or **II PAUSE** to stop recording or playback. (Auto-superimposing) (Q-11)

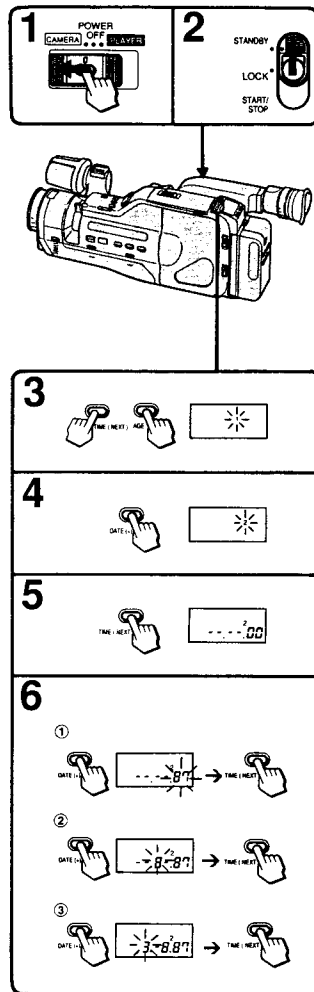
- 1 Press COLOR/MODE to select the display mode of the title in the standby or playback pause mode.**
- 2 Start recording or playback.**
- 3 Press AUTO.**
- 4 Press START/STOP or **II PAUSE** at the point which you want to stop recording or playback.**
After the title is displayed for a few seconds, recording or playback stops.

The auto-superimposing is cancelled when:

- The auto-superimposing is performed once.
- You press AUTO again before the superimposing is performed.
- You perform other operations (e.g. editsearch or various speed playback) in the standby or playback pause mode.
- You press SUPERIMPOSE ON/OFF before superimposing is performed.

Recording the Age of Your Child

(R-1)



You can record the age (in years and months) of your child, by storing his/her birth date in your camcorder.

Once you store your child's date of birth, your child's age is automatically updated and displayed by pressing a single button. In this way, you can make a record of your child's development.

Besides age, you can also store the date of a specific event, and record how many years and months have passed since then.

You can record up to three ages or events.

Storing the Birth Date/Event Date

Before you begin

Before you store a birth date in your camcorder, make sure that power source is connected, that the lithium battery is installed and that the date is correctly set.

How to store (R-1)

Example: Store "3.8. 1987" in memory 2.

- 1 Set POWER to CAMERA while pressing the green button.
- 2 Slide STANDBY up.
- 3 Press AGE and TIME (NEXT) simultaneously for more than one and a half seconds until the "1" indication blinks in the display window.
- 4 Press DATE (+) to select 2. Each time you press DATE (+), the indication in the display window changes as follows:
1 → 2 → 3
In the viewfinder, the indication changes as follows:
[1] BIRTHDAY → [2] BIRTHDAY
[3] EVENT ← [1]
Although "EVENT" is displayed on [3], you can use it for age as well. You can also use [1] and [2] for event.
- 5 Press TIME (NEXT). "---" appears.
- 6 Enter the birth date. First adjust the blinking digits with DATE (+), and then press TIME (NEXT). The age is displayed when all the items are adjusted.

Recording the Age of Your Child

If you missed the desired number with DATE (+)

Keep pressing DATE (+). The number changes as follows:

Year: 00 → 01 → ... → current year
current year - (minus) 99 ←

Month: 1 → 2 → ... → 12 → ...

Day: 1 → 2 → ... → 31

To correct/change the setting

Follow the procedure from step 1 again.

To advance the digits faster

Keep DATE (+) pressed.

To preset the year before 1900

- 1 After step 5 on the previous page, keep pressing DATE (+) until the current year is displayed.
- 2 Press DATE (+) again. The year goes back 99 years. (example: 1991 → 1892)
- 3 Go to step 6.

When in 2000

"--- 01" is displayed in step 5 on the previous page. After that, it advances every year as "1902, 1903, ...".

Recording the Age of Your Child

Recording the Age

You cannot add the age later during playback or editing. Be sure to follow the procedure below. (R-2)

- 1 During recording, press START/STOP at the point where you want to insert the age indication.
The camcorder is set in the standby mode.

- 2 Press AGE to select the indication you want to record.
Each time you press AGE, the indication changes as follows:

No indication → 1 The first age
3 The third age ← 2 The second age
An item with no presetting is skipped.
The 1, 2, or 3 indication goes out.

- 3 Press START/STOP.
Recording starts again.
The age displayed in the viewfinder is recorded with the picture.

To stop recording the age
Press AGE until the indication goes out.

To change the display while recording
Press AGE until the indication you want to record is displayed. Recording of the indication you selected starts when 1, 2, or 3 goes out.

To cancel the stored birth date/event date
1 Proceed steps 1 to 4 of "Storing the Birth Date/Event Date" on page 48 and select the item you want to cancel.

- 2 Press TIME (NEXT) twice.
"Month" blinks.
- 3 Press DATE (+) until "-" appears.
- 4 Press TIME (NEXT).
The birth date/event date is deleted from the memory and is not displayed when you press AGE.

Recording the Age of Your Child

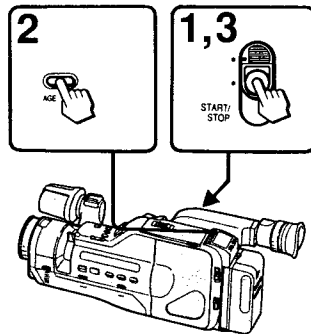
About memory back-up

The camcorder uses the lithium battery on the bottom to keep the birth date/event date in memory. The lithium battery life is approximately 1 year.

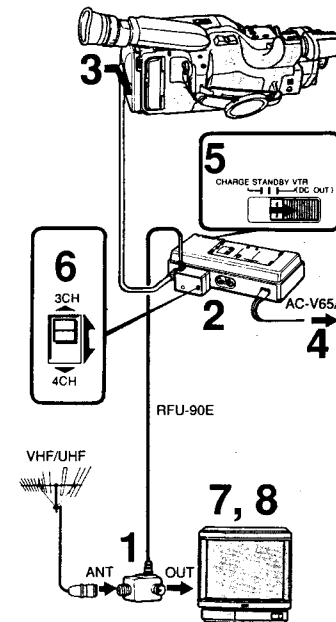
When you connect the camcorder to a TV

If you do not use the data-screen function, the age indication will appear on the TV screen when the 1, 2, or 3 indication goes out in the viewfinder and recording starts.

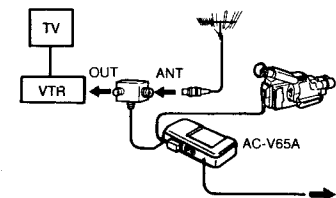
(R-2)



(S-1)



(S-2)



Connections for Playback

You can easily make a proper connection of the camcorder and TV by using the supplied AC-V65A AC power adaptor. Check the following connecting examples and go to the appropriate section to make the necessary connections.

You can also connect the camcorder directly to the TV, using the VIDEO/AUDIO (and RFU DC OUT) jacks.

Case 1: Connecting the camcorder directly to the TV without video/audio input jacks

Case 2: Connecting the camcorder directly to the TV with video/audio input jacks

Case 1: Connecting a TV without Video Audio Input Jacks (S-1)

For the customers supplied with the RFU-90E

Before you begin

- Use the supplied RFU adaptor and AC power adaptor.
- Make sure that the TV is turned off.

How to connect

- 1 Connect the antenna and TV to the RFU adaptor.
- 2 Connect the RFU adaptor to the AC power adaptor.
- 3 Attach the connecting plate of the AC power adaptor to the camcorder.
- 4 Connect the AC power adaptor to a wall outlet.
- 5 Set CHARGE/VTR of the AC power adaptor to VTR.
- 6 Select the RF unit selector of the adaptor to 3CH or 4CH, whichever is not active in your area.
- 7 Turn on the TV and select the 0 position.
- 8 Tune the TV so that you can get picture and sound from the camcorder.

Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

When you watch a TV programme

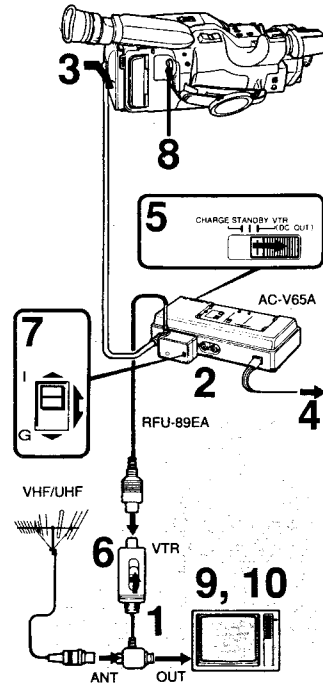
Set the CHARGE/VTR selector on the AC power adaptor to STANDBY or turn off the power of the camcorder.

If your TV is connected with a VTR (S-2)

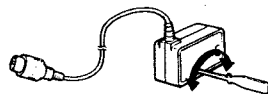
Connect the camcorder to the VTR instead of the TV.

Connections for Playback

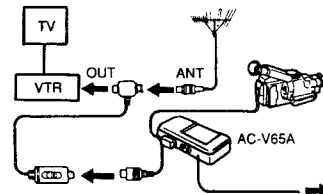
(S-3)



(S-4)



(S-5)



For the customers supplied with the RFU-89EA (S-3)

Before you begin

- Use the supplied RFU adaptor and AC power adaptor.
- Make sure that the TV is turned off.

How to connect

- 1 Connect the antenna and TV to the RFU adaptor.
- 2 Connect the RFU adaptor to the AC power adaptor.
- 3 Attach the connecting plate of the AC power adaptor to the camcorder.
- 4 Connect the AC power adaptor to a wall outlet.
- 5 Set CHARGE/VTR of the AC power adaptor to VTR.
- 6 Set the selector switch of the aerial selector to VTR.
- 7 Set the I/G selector of the RFU adaptor according to the TV system of your country.
- 8 Set POWER of the camcorder to CAMERA, insert a tape and slide STANDBY up.
- 9 Turn on the TV and select a programme position that is not used to receive a TV station.
- 10 Tune the TV so that you can get picture and sound from the camcorder.

When the playback picture is not free of disturbance

- 1 Set the selector switch of the aerial selector to ANT.
- 2 Select programme position on the TV between UHF channels 30 and 39, so that the TV shows no picture and a steady rustling sound or no sound is heard.
- 3 Set the selector switch of the aerial selector to VTR.
- 4 Turn the RF channel setting screw of the RFU adaptor slowly with the supplied screwdriver so that playback picture is clearly displayed on the TV screen. (S-4)

Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

If your TV is connected with a VTR
Connect the camcorder to the VTR instead of the TV. (S-5)

Connections for Playback

Case 2: Connecting a TV with Video/Audio Input Jacks

(S-6)

Before you begin

- Use the supplied AC power adaptor and appropriate A/V connecting cable.
- Make sure that the TV is turned off.

How to connect

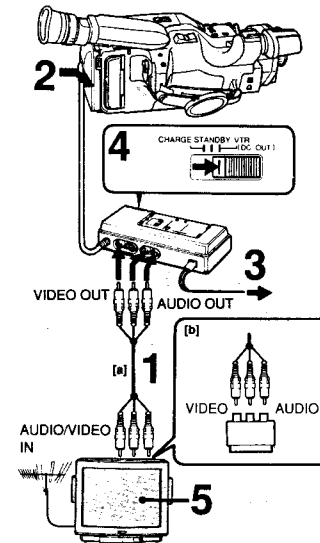
- 1 Connect the AC power adaptor to the TV.
[a] when your TV has phono type jacks
[b] when your TV has a 21-pin connector (EUROCONNECTOR)*
*Use the supplied plug adaptor.
- 2 Attach the connecting plate of the AC power adaptor to the camcorder.
- 3 Connect the AC power adaptor to a wall outlet.
- 4 Set CHARGE/VTR of the AC power adaptor to VTR.
- 5 Set the TV/VIDEO selector on the TV to VIDEO.

If your TV is connected with a VTR (S-7)
Connect the AC power adaptor to the VTR instead of the TV.

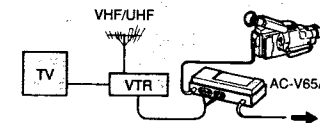
If your TV is a monaural type (S-8)

Connect the TV and the AC power adaptor as illustrated (The red plugs are free.). Be sure to set HIFI SOUND on the camcorder to ● or 1. When your TV has a 21-pin connector, use the supplied plug adaptor in addition to the supplied A/V connecting cable. You can connect the camcorder directly to the monaural TV. Connect the supplied A/V connecting cable to the camcorder instead of the AC power adaptor.

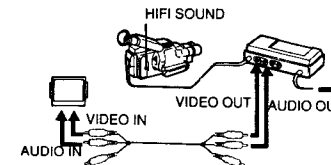
(S-6)



(S-7)



(S-8)



Playing Back a Tape

The supplied wireless Remote Commander is useful to control the camcorder from a distance. When using it, be sure to set the  REMOTE COMMANDER ON/OFF switch to ON.

(T-1)

- 1** Set **CHARGE/VTR** on the **AC power adaptor** to **VTR**.
- 2** Set **POWER** to **PLAYER** while pressing the **green button**.
- 3** Insert a **tape**.
- 4** Turn on the **TV (or the VTR)**.
 - For a TV with video/audio input jacks, set the **TV/VIDEO** selector to **VIDEO**.
 - For a TV without video/audio input jacks, select the programme position for playing back the camcorder.

- 5** Press **▶**.
Playback begins.

To stop playback, press .

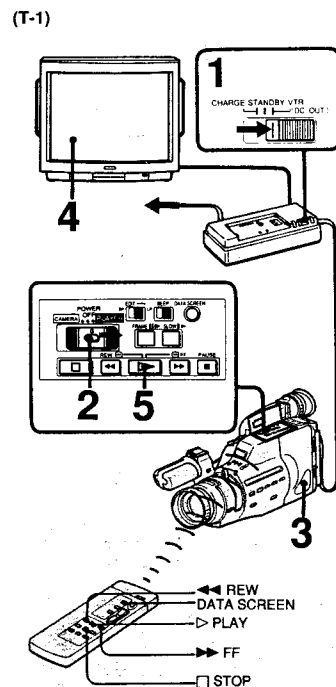
To rewind the tape, press ◀◀.

To advance the tape rapidly, press ►►.

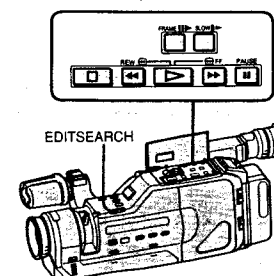
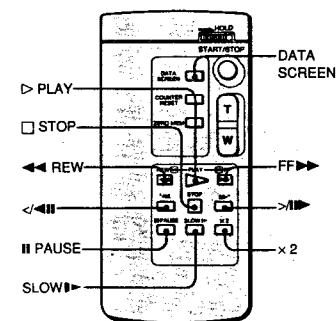
To display the same indications on the TV as in the viewfinder, press DATA SCREEN. To turn them off, press it again.

After playing back

Set POWER on the camcorder to OFF and CHARGE/VTR on the AC power adaptor to STANDBY.



(T-2)



Playing Back a Tape

Various Playback Modes

(T-2)

To view the still picture (playback pause)

Press **||** PAUSE during playback.

|| appears in the viewfinder.

To resume normal playback, press **▷** or **II**.

Note:

When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

To change the playback direction

Press **</II** for the reverse or **>/II** for the forward direction during playback. **>/II** on the camcorder is only for the forward direction. **-x1** or **x1** appears in the viewfinder.

To view the picture at 1/5 speed (slow playback)

Select the playback direction with **</◀||** or **>/▶||**, and then press **SLOW ▶▶** during playback.

SLOW ► on the camcorder is only for the forward direction.

◀ or ▶ appears in the viewfinder.

To resume normal playback, press .

Note:

When slow playback lasts for 1 minute or more, the forward or reverse playback at the normal speed starts automatically, depending on the tape direction.

**To view the picture at double speed
(only on the Commander)**

Select the playback direction with **</◀** or **>/▶**, and then press **x2** on the Commander. **-x2** or **x2** appears in the viewfinder.

To resume normal playback, press **▶**.

To view the picture frame-by-frame

In the still picture mode, press **</◀||** or **>/||▶**. Each time you press the button, the picture appears by a frame.

▶▶ on the camcorder is only for the forward direction. **◀◀** or **▶▶** appears in the viewfinder. If you keep pressing **◀▶/▶▶**, playback at 1/25 speed starts.

To resume normal playback, press .

Playing Back a Tape

To locate the desired scene (picture search)
Keep pressing ◀◀ or ▶▶ during playback or in the still picture mode. ⏮ or ⏭ appears in the viewfinder.

To resume normal playback, release the button.

To locate the desired scene quickly (skip scan)

Press ◀◀ during rewinding or ▶▶ during advancing the tape rapidly. ⏮ or ⏭ appears in the viewfinder.

To resume normal playback, press ▷.

About the playback sound

In the various playback modes, streaks appear. The sound can be heard during playback at double speed in forward direction, but may not be clear as normal speed playback.

If the still picture, frame-by-frame picture, or slow playback picture is noisy

Set the camcorder in slow playback mode, and press the + or - side of EDITSEARCH until the least noisy picture appears.

Note

Streaks appear in the still picture. They are wider when playing back an SP-recorded tape.

Playing Back the Dual Sound Recorded Tape

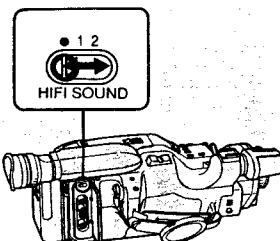
(T-3)

Normally set HIFI SOUND to ● position.
When the dual sound recorded tape is played back, set HIFI SOUND to the desired sound, 1 or 2.

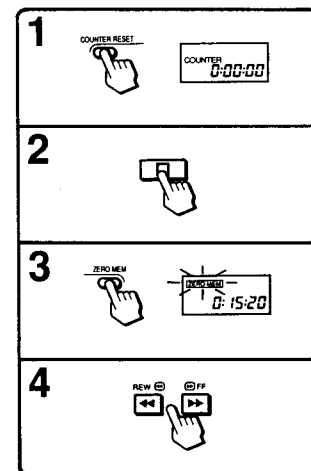
Note

When you connect the TV using the RFU adaptor, or when the TV or VTR is a monaural type, set HIFI SOUND to 1 or 2.

(T-3)



(U)



Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

To Index the Whole Tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00". Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

To Return to a Pre-registered Point

(U)

1 During playback, press COUNTER RESET at the point you later want to locate.
The counter shows "0:00:00".

2 Press [] when the playback has finished, as usual.

3 Press ZERO MEM.
The "ZERO MEM" indicator blinks in the viewfinder.

4 Press ◀◀ or ▶▶.
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

Notes on the tape counter and ZERO MEM button

- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds, especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.
- Be sure to press ZERO MEM after you stop the tape. It does not function during playback.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to the point where you pre-registered.

Editing onto Another VTR

You can create your own video programme by editing with any other 8-mm, Betamax or VHS VHS format VTR. You can also superimpose and record the titles during editing.

Before You Begin

- Make connections using the supplied A/V connecting cable [a], or A/V connecting cable and plug adaptor (supplied) [b].
[a] when your VTR has phono type jacks
[b] when your VTR has a 21-pin connector (EUROCONNECTOR).
- Set the input selector of the VTR to LINE, if available.

Operation

(V)

- 1 Insert a tape to be recorded on into the recording VTR.
- 2 Set EDIT on the camcorder to the direction of the arrow (EDIT ON).
- 3 Set CHARGE/VTR on the AC power adaptor to VTR.
- 4 Set POWER of the camcorder to PLAYER and insert your recorded tape.
- 5 Play back on the camcorder and locate the point where you wish to start editing and set the camcorder to the playback pause mode.
- 6 On the recording VTR, locate the recording starting point and set the VTR to the recording pause mode.
- 7 Press II of both VTRs simultaneously to start editing.

To edit more scenes, repeat steps 5 to 7.

To stop editing momentarily, press II on the recording VTR.

To stop editing, press ☐ on both VTRs.

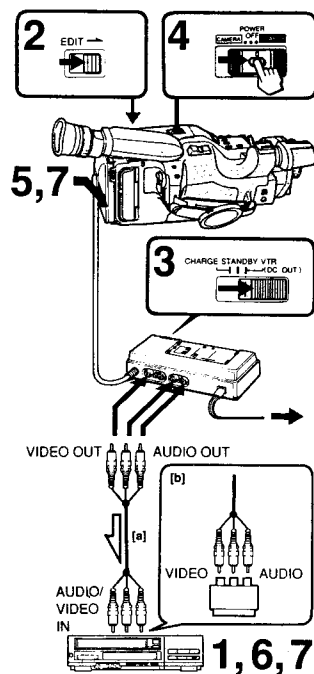
Use of the EDIT switch

When you set EDIT to the direction of the arrow (EDIT ON), picture and sound deteriorations resulting from editing can be kept to the minimum. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

If you use the DATA SCREEN function

You can record the indications displayed on the TV screen.

(V)



(W-1)



(W-2)



Hints for Better Shooting

Getting Stable Pictures

Take a good posture for shooting (W-1)

For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip belt so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Place your eye firmly against the viewfinder eyecup.
- Do not cover the infrared beam window.

Use a tripod

If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

Keep the horizontal plane level (W-2)

The horizontal plane can be easily determined by using the viewfinder frame as a reference.

Planning Ahead

If you are going to edit the tape after recording

Shoot the scene a little longer to make the editing easier.

If you are not going to edit the tape after recording

First record a title and then use the START/STOP button to make a smooth recording.

Hints for Better Shooting

Lighting

Shoot with the sun behind you

When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

Use video lights in the dark

To get the best colours, a sufficient light level must be maintained.

Photography lamps or halogen lamps are recommended. For best results, use of Sony video lights are recommended since their weight and low heat output levels allow safe, direct connection to the camcorder.

For detailed instructions on proper use of the light, read its instruction manual.

Brightness levels

Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording technique.

Situation	Brightness	Condition
Snow-covered mountains	Unit: lux	ND filter recommended
Snow fields		
Sandy beach, clear day in summer		
Clear day, mid day (100,000 lux)	100,000	
Clear day, mid-afternoon (35,000)		
Overcast day, mid-day (32,000)	10,000	
Overcast day, one hour after sunrise (2,000)		
Office lit by fluorescent lamps, near window (1,000)		Normal recording
Clear day, one hour before sunset (1,000)	1,000	
Department store counter (500 – 700)		
Station wicket (850)		
Office lit by fluorescent lamps (400 – 500)	500	
Room lit by two 30 W fluorescent lamps (300)	300	
Subway station platform (300)		
Arcade at night (150 – 200)	100	
Theater lobby (15 – 35)		
Candlelight (10 – 15)	10	Video light recommended

(X-1)



(X-2)



Notes and Precautions

Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

If moisture condenses inside the unit

(X-1)

Moisture is present inside the camcorder when:

- The  indication in the viewfinder blinks. When the tape is inserted, the  indication also blinks.
- Beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for tape ejection will work.

Eject the tape, turn off the camcorder, and leave it with the cassette holder open for at least 1 hour.

The camcorder can be used again if the  indication does not appear when the power is turned on again.

If moisture condenses on the surface of the tape

(X-2)

Moisture is present on the surface of the tape when:

- The  indication blinks inside the viewfinder when the tape is inserted and a tape transport button (▶, ◀, etc.) is pressed.
- Beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for tape ejection will work.

Eject the tape and let it sit for at least 1 hour.

The tape can be used again if the  indication does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No caution indications will appear, but the picture becomes dim.

Turn off the power and leave the camcorder unused for at least 1 hour.

Notes and Precautions

Notes on Video Head Cleaning

(V)

To ensure clear picture, clean the video heads periodically.

When playback pictures are noisy or hardly visible, the video heads may be contaminated.

[a] Slight contamination

[b] Critical contamination

In such cases,

- 1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
- 2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
- 3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Precautions

On operation

- Operate the camcorder on 6.0V (battery pack), 7.5V (AC power adaptor), or 9.0V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.

Notes and Precautions

- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it because heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder**
When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired.
- **Do not let the camcorder get wet**
Keep the camcorder from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.

On care

- When the unit will not be used for a long time, periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Note on copyright

Television programmes, films, video tapes and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Using Your Camcorder Abroad

Each country has its own electricity system and TV colour system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110V to 240V AC, 50/60 Hz.

Differences in colour systems

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be a PAL system based TV and should have video/audio inputs.

PAL system countries

Australia, Austria, Belgium, China, Denmark, Finland, Germany (Former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL-M system country

Brazil

PAL-N system countries

Argentina, Paraguay, Uruguay

NTSC system countries

Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, The Philippines, U.S.A., etc.

SECAM system countries

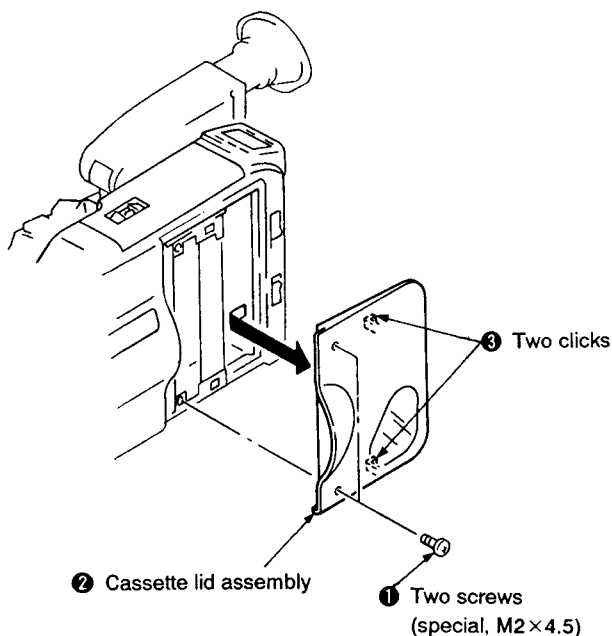
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, The Soviet Union, etc.

SECTION 2

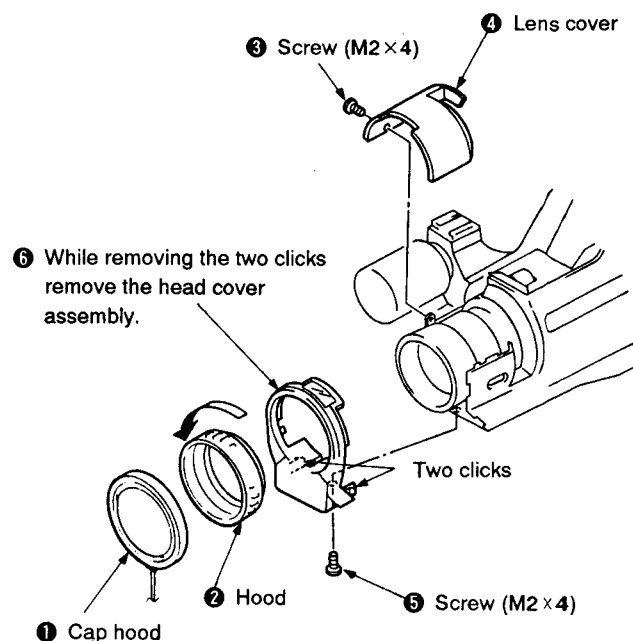
DISASSEMBLY

2-1. REMOVAL OF CASSETTE LID ASSEMBLY

Note: When mounting, fit the two clicks ❸ into holes completely, then clamp two screws ❶.

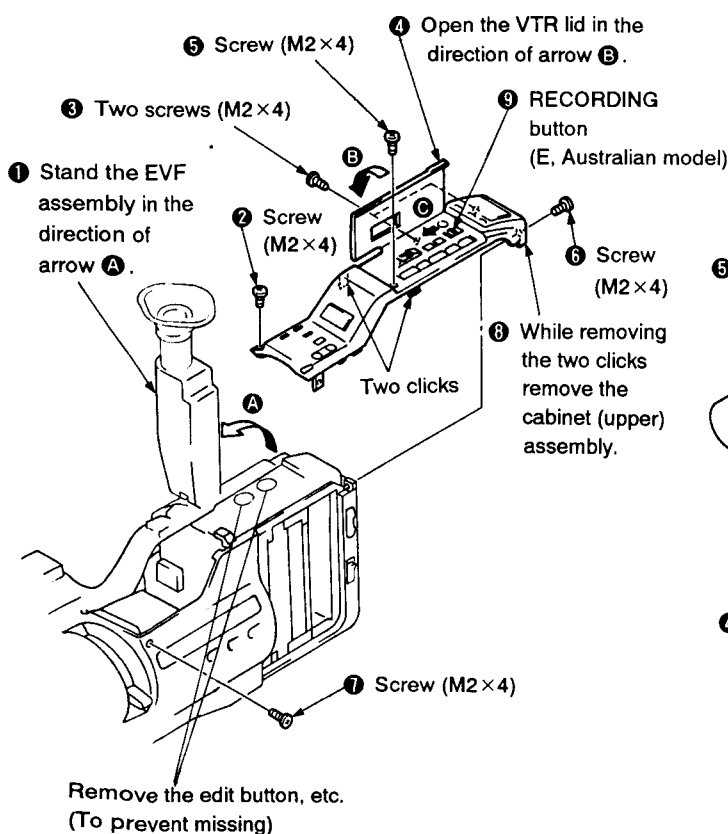


2-3. REMOVAL OF HEAD COVER ASSEMBLY



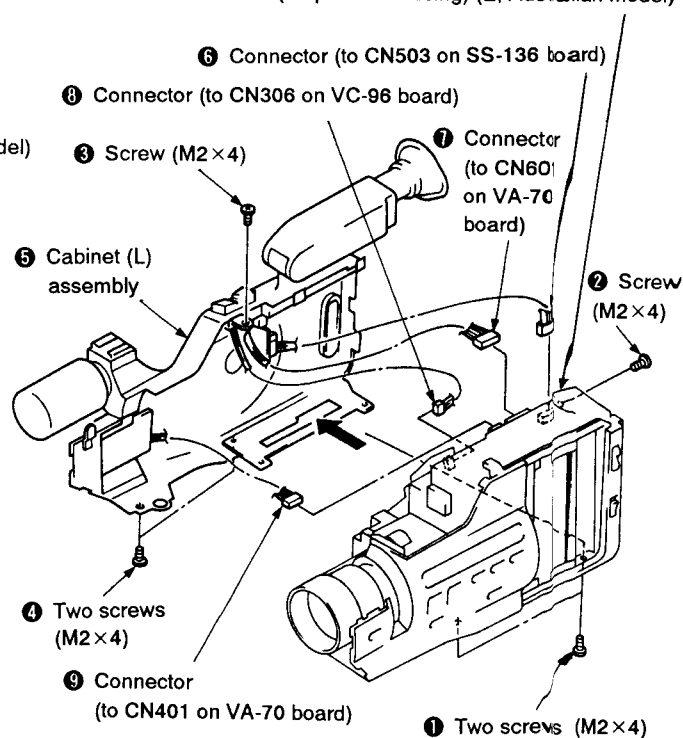
2-2. REMOVAL OF CABINET (UPPER) ASSEMBLY

Note: When mounting, gather up RECORDING button ⑨ in the direction of arrow ㉞.

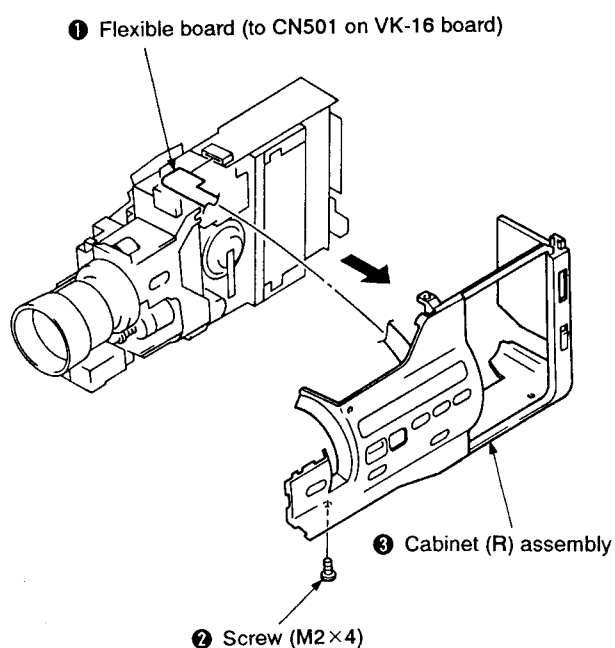


2-4. REMOVAL OF CABINET (L) ASSEMBLY

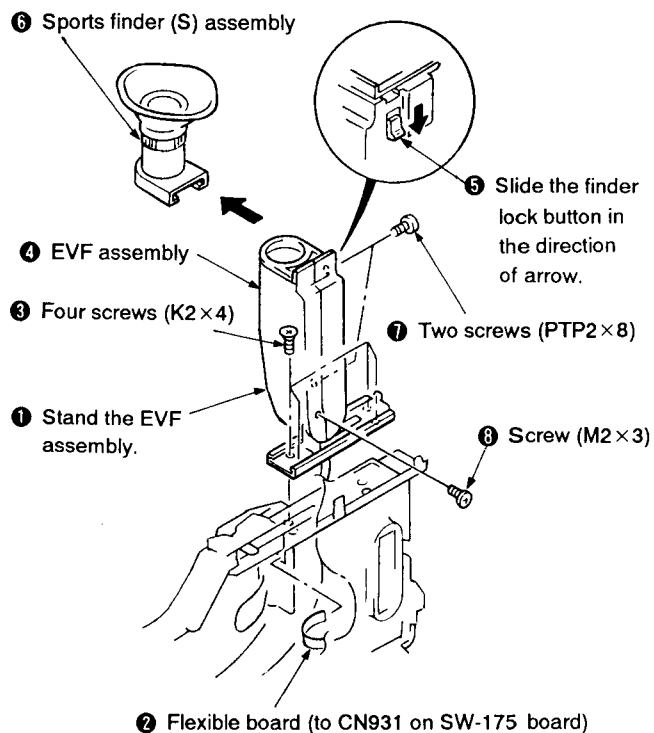
Remove the Input-output button, etc.
(To prevent missing) (E, Australian model)



2-5. REMOVAL OF CABINET (R) ASSEMBLY

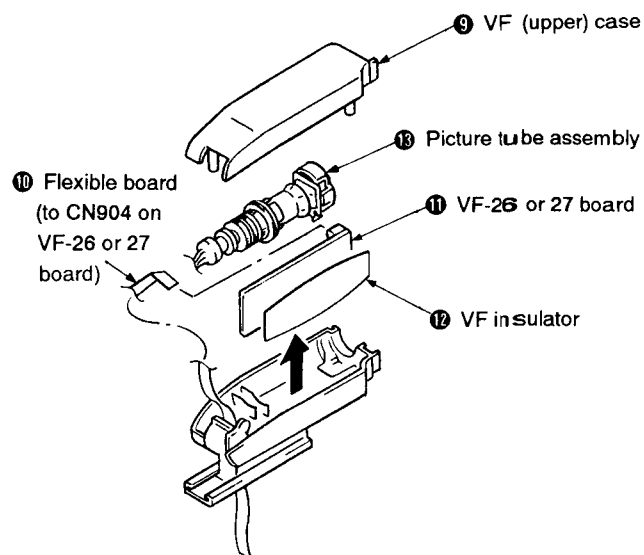
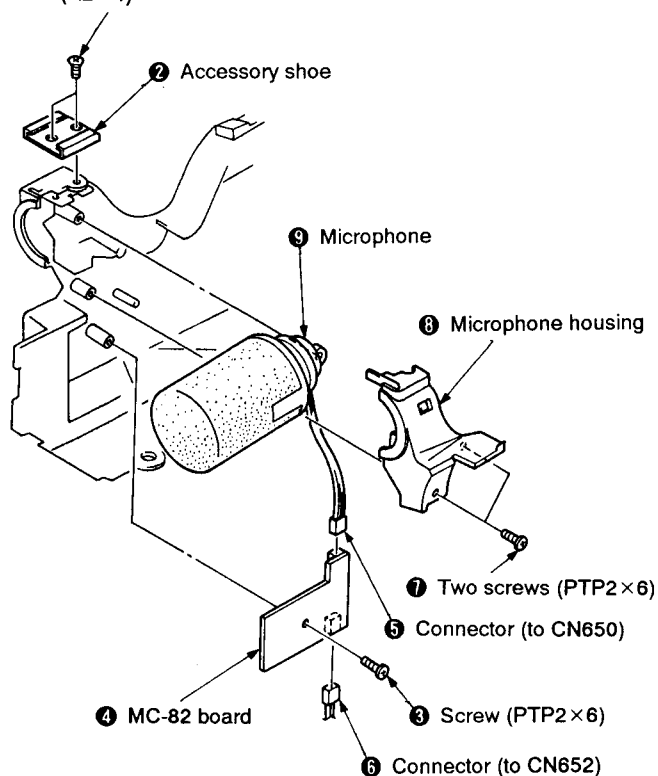


2-7. REMOVAL OF EVF ASSEMBLY

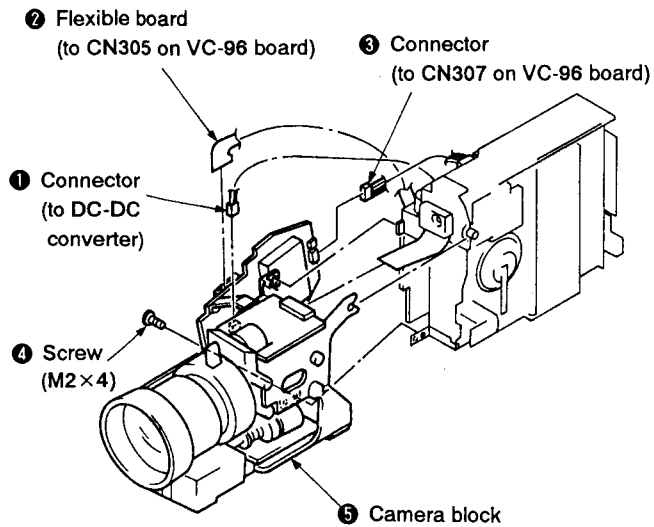


2-6. REMOVAL OF MICROPHONE (MC-82 BOARD)

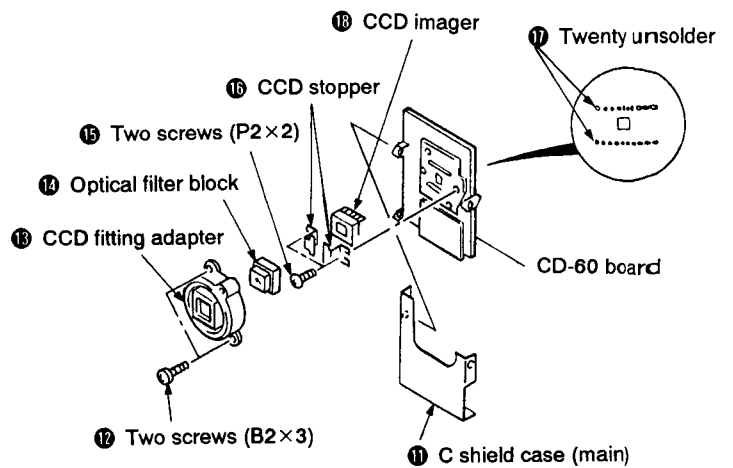
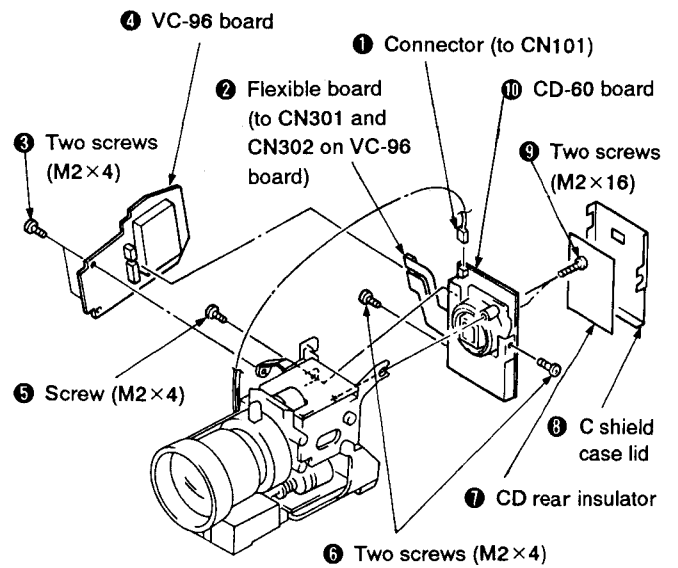
- 1 The removal can be done only by removing the front screw. (K2×4)



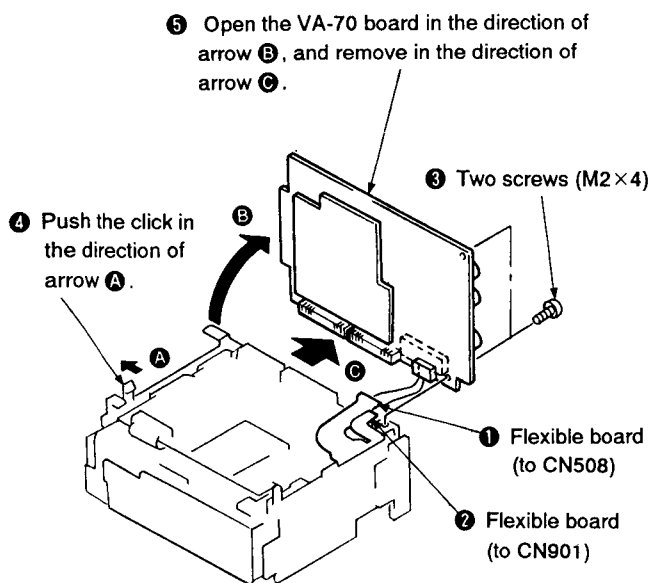
2-8. REMOVAL OF CAMERA BLOCK



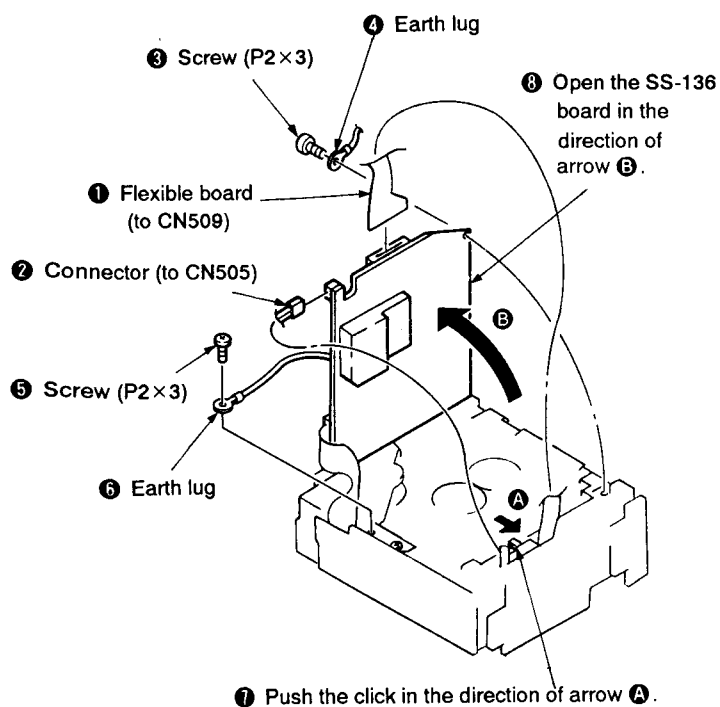
2-9. REMOVAL OF CCD IMAGER (CD-60 BOARD)



2-10. REMOVAL OF VA-70 BOARD

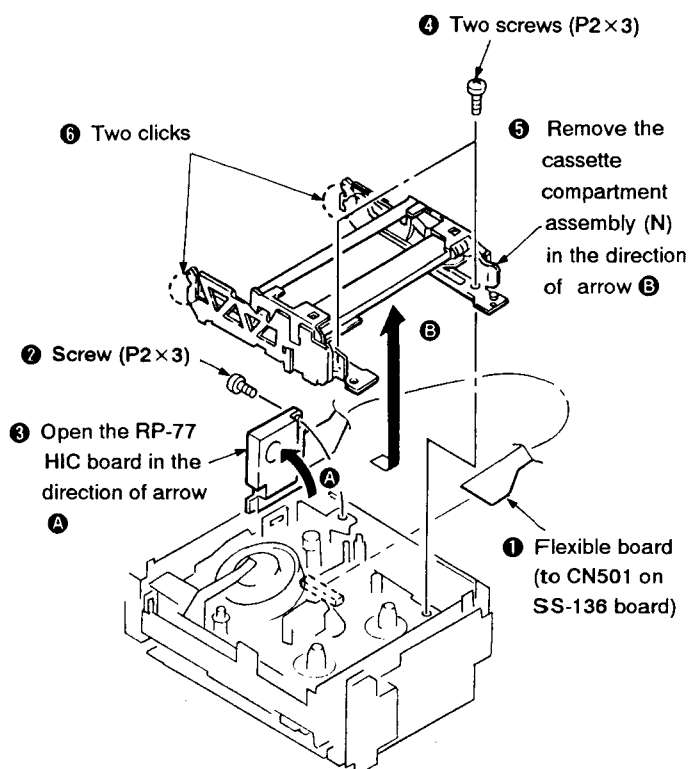


2-11. OPENING OF SS-136 BOARD



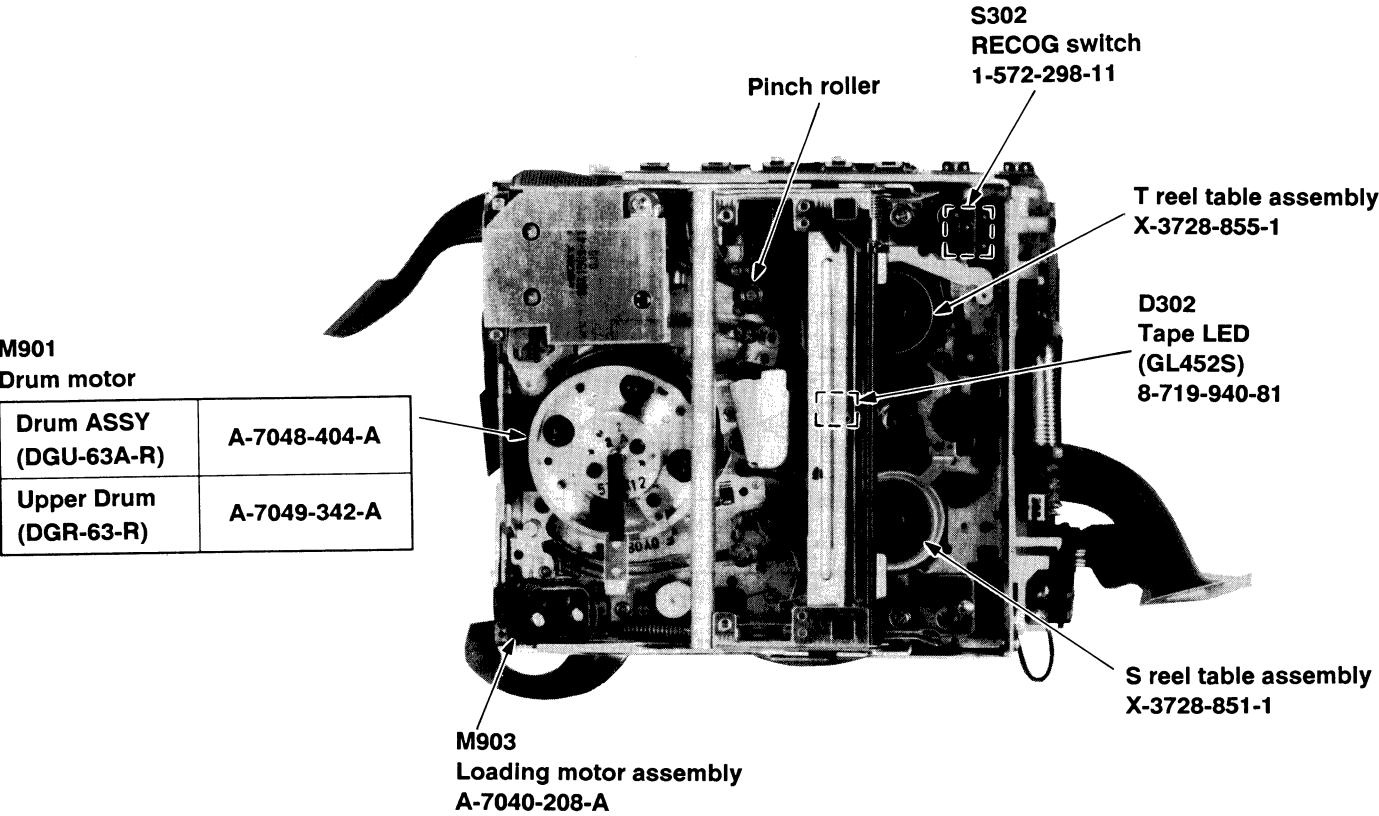
2-12. REMOVAL OF CASSETTE COMPARTMENT ASSEMBLY (N)

Note: When mounting, fit the two clicks **⑥** into completely, then clamp two screws **④**

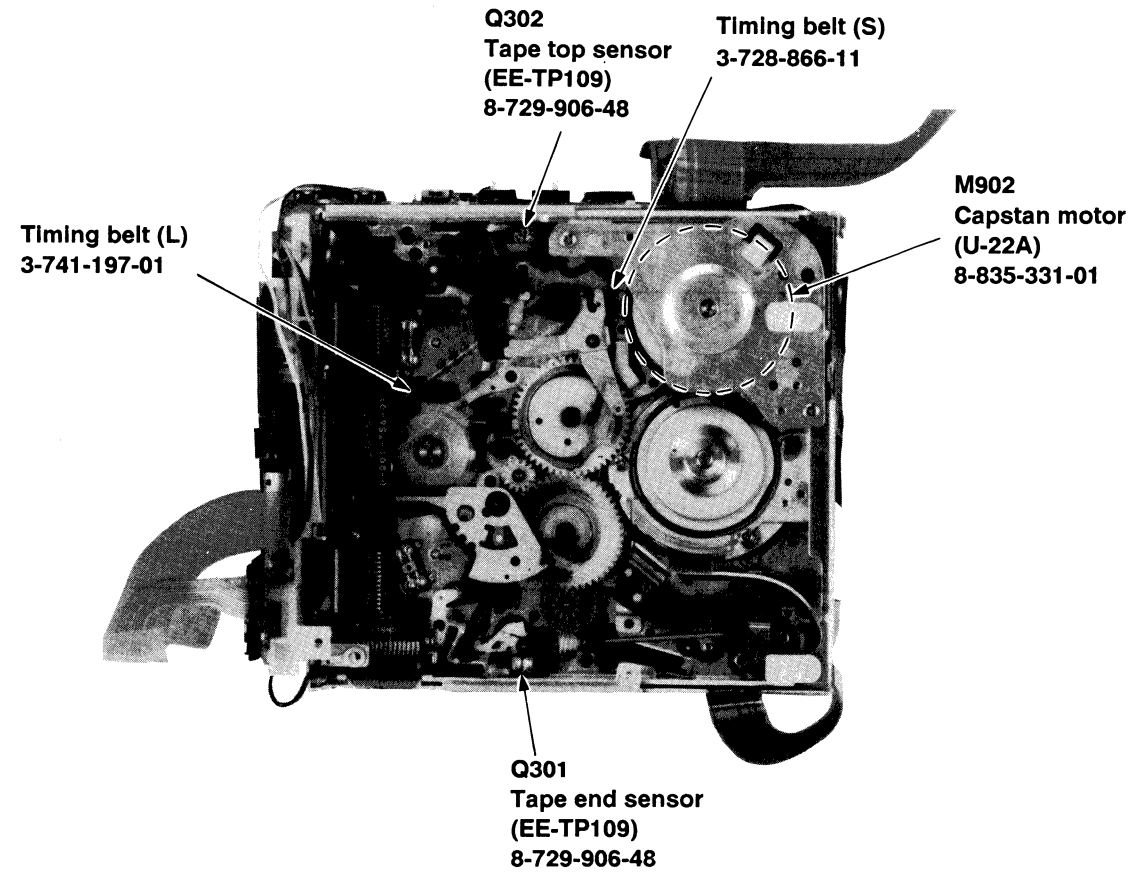


2-13. INTERNAL VIEWS

— Upper —



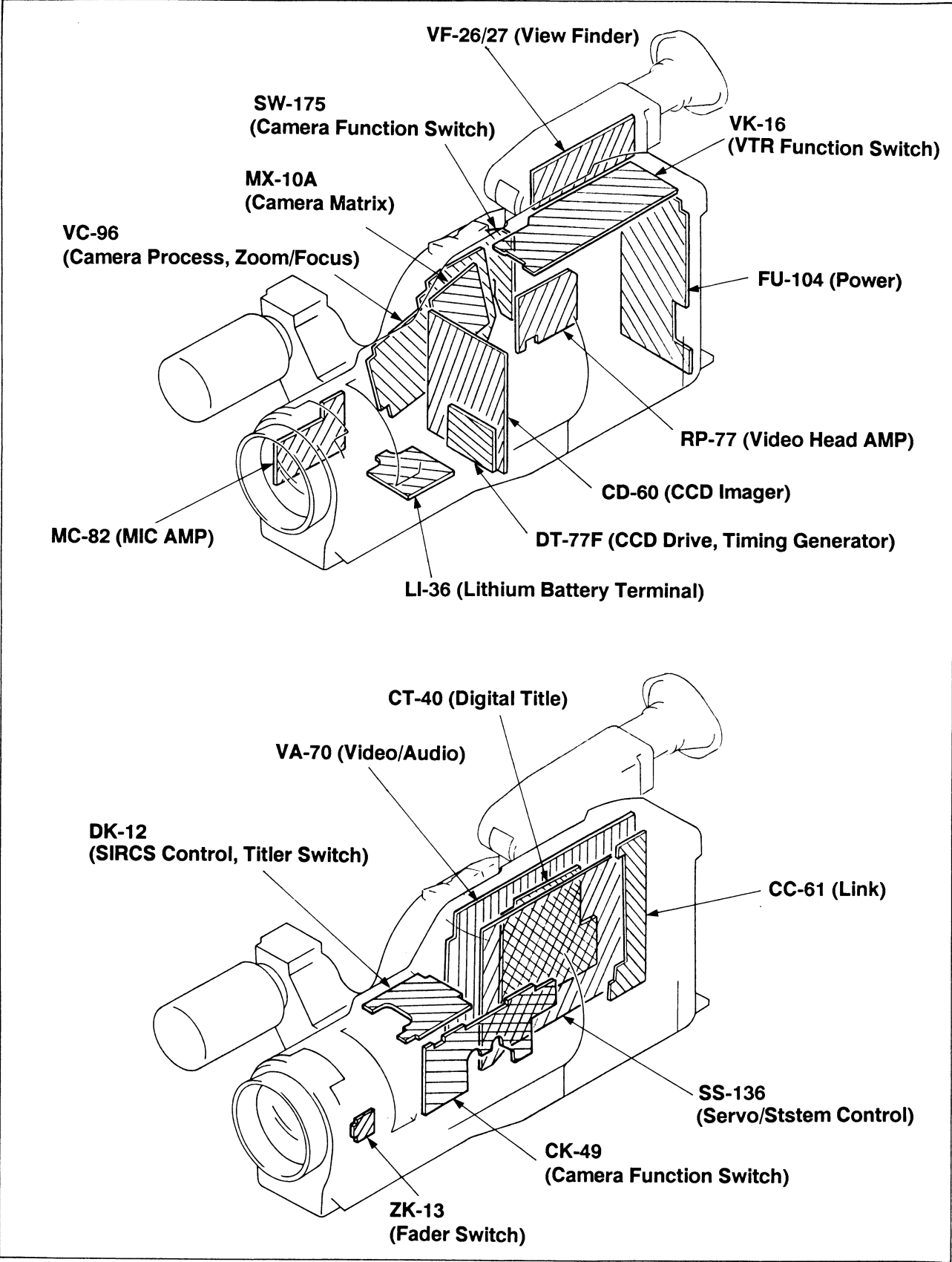
— Lower —



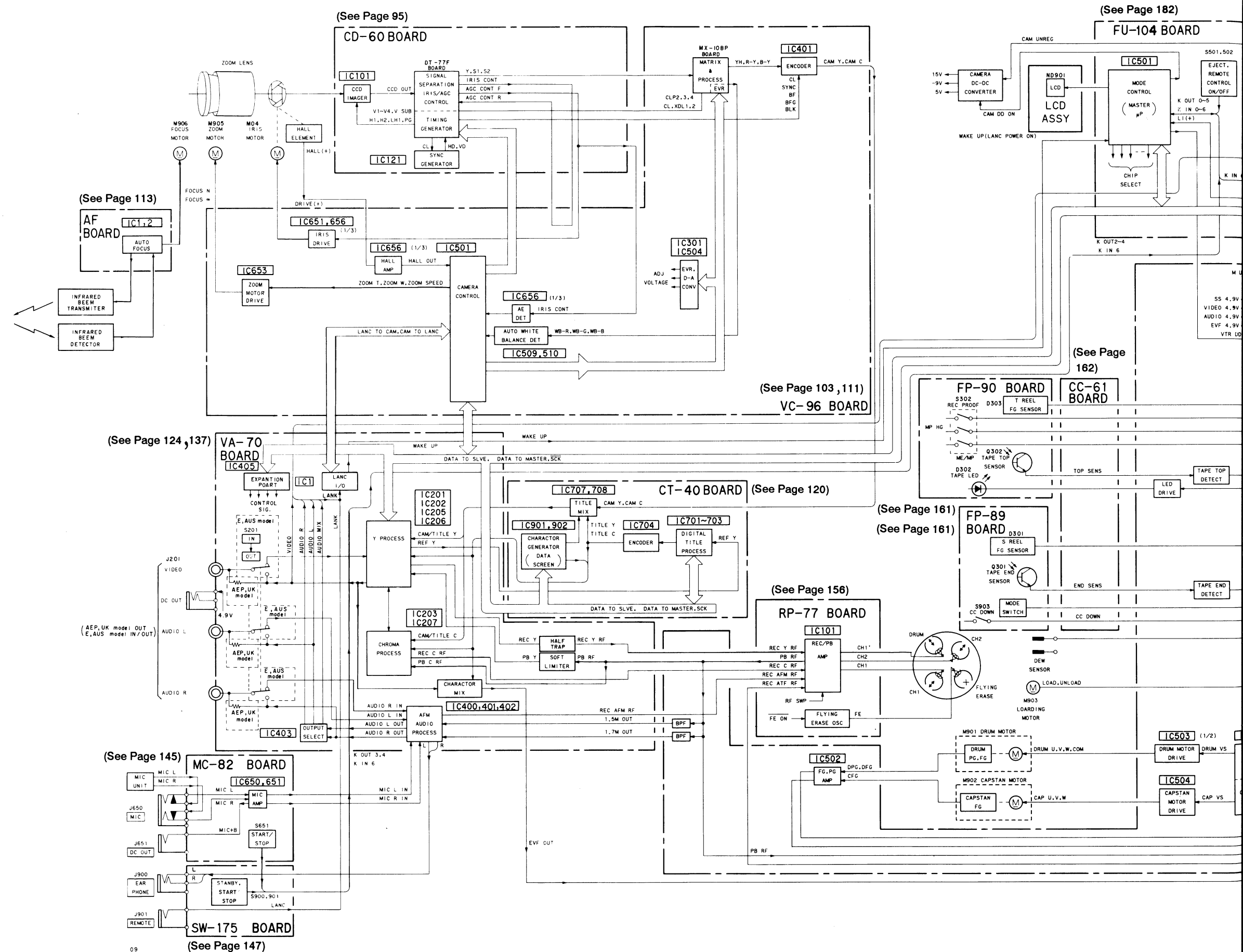
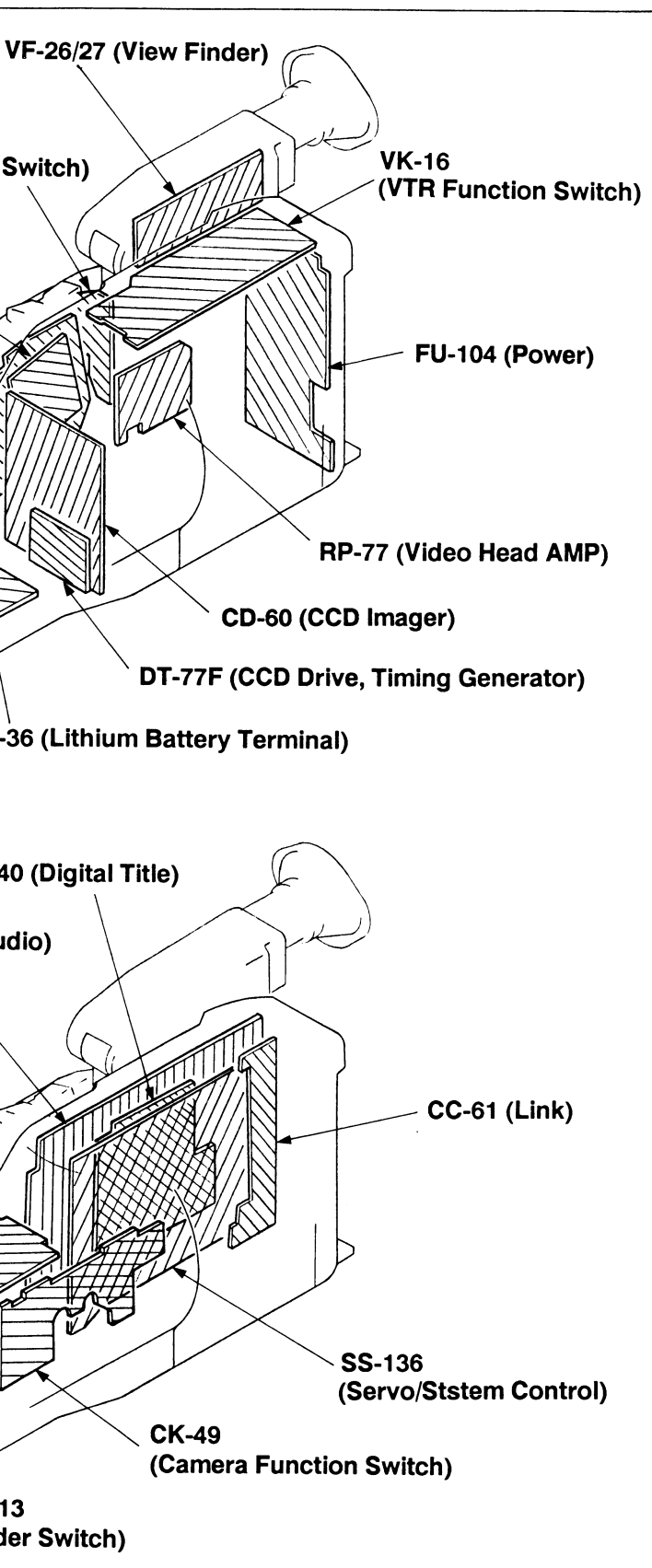
SECTION 3
DIAGRAMS

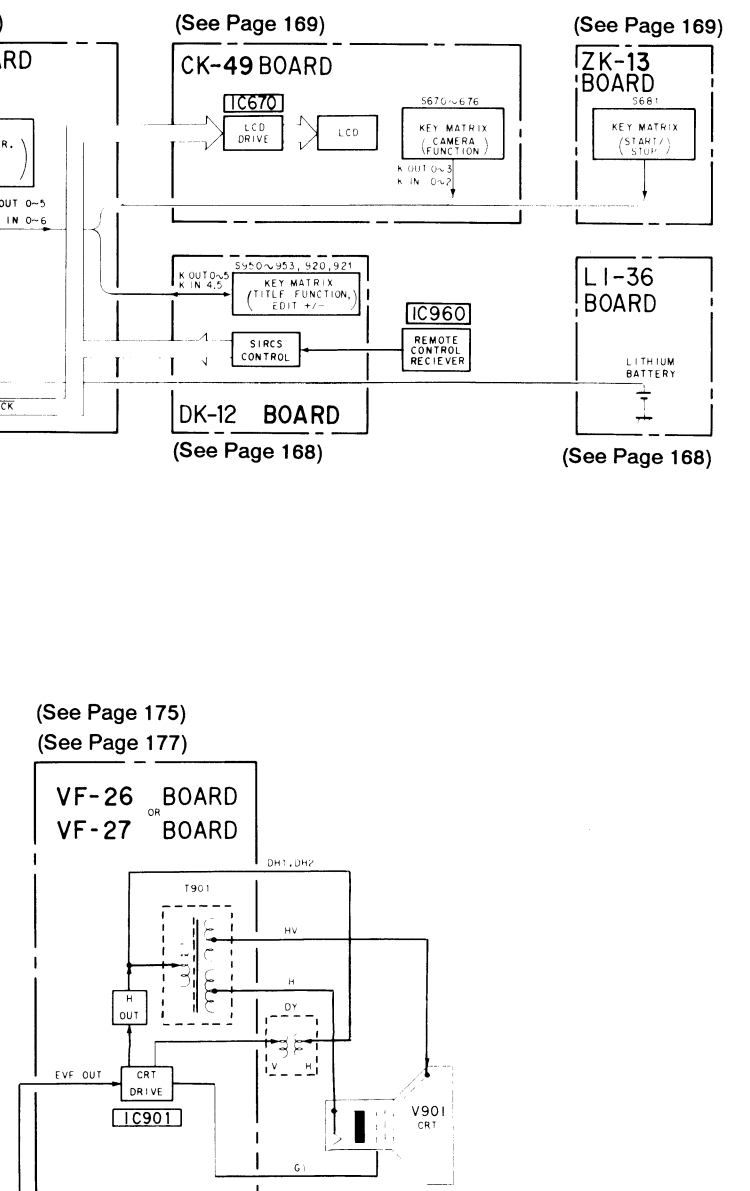
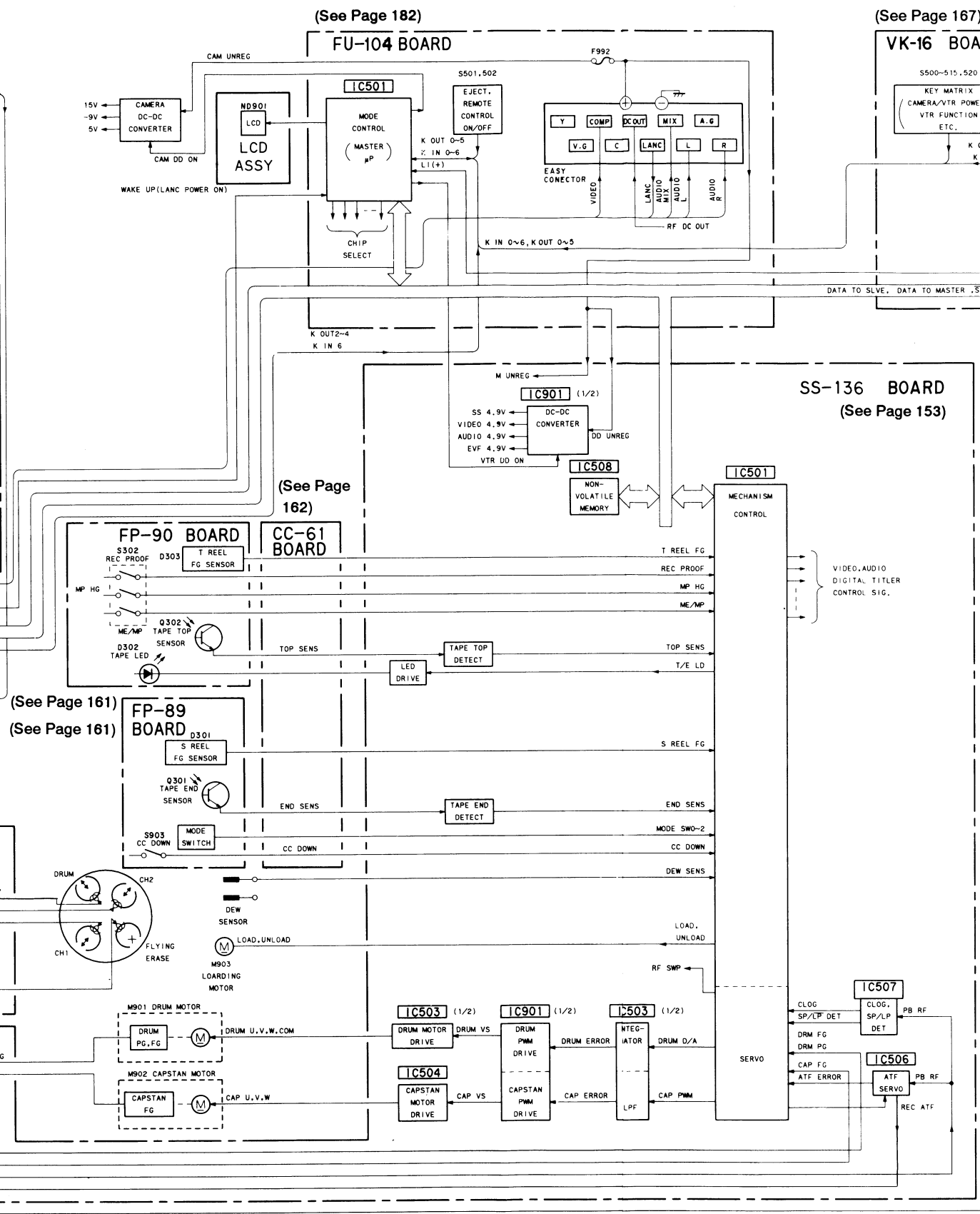
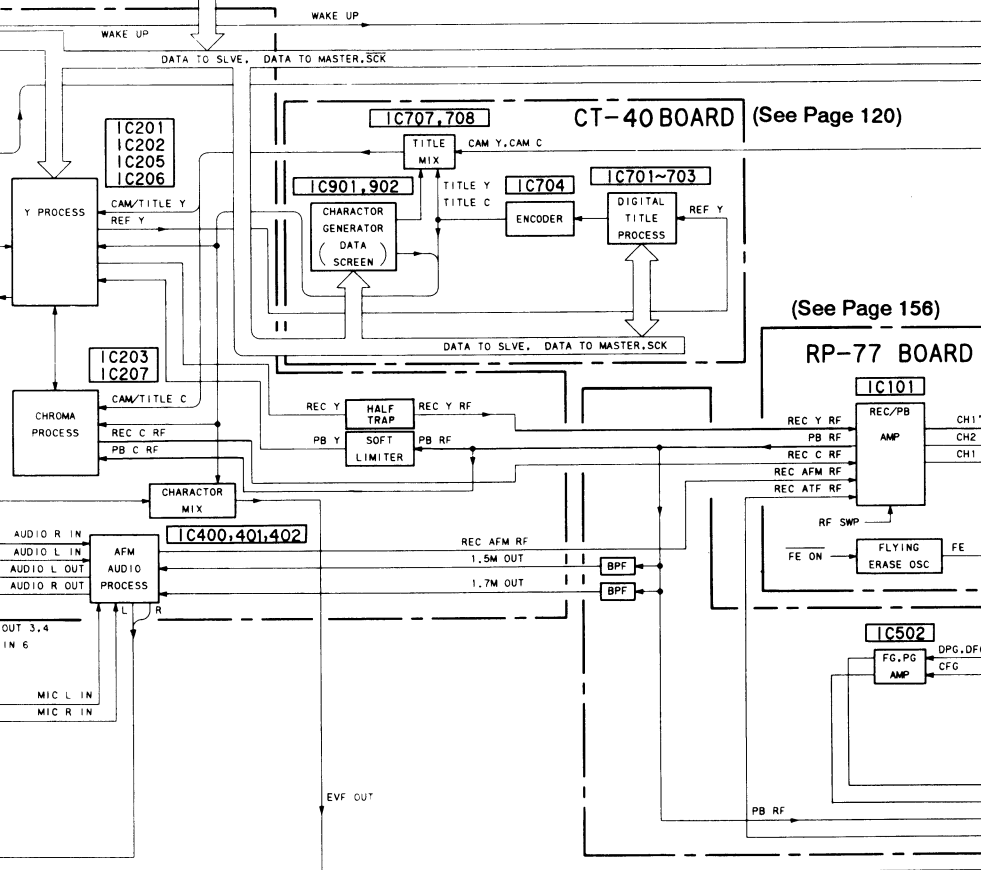
3-2. OVERALL B

3-1. CIRCUIT BOARDS LOCATION



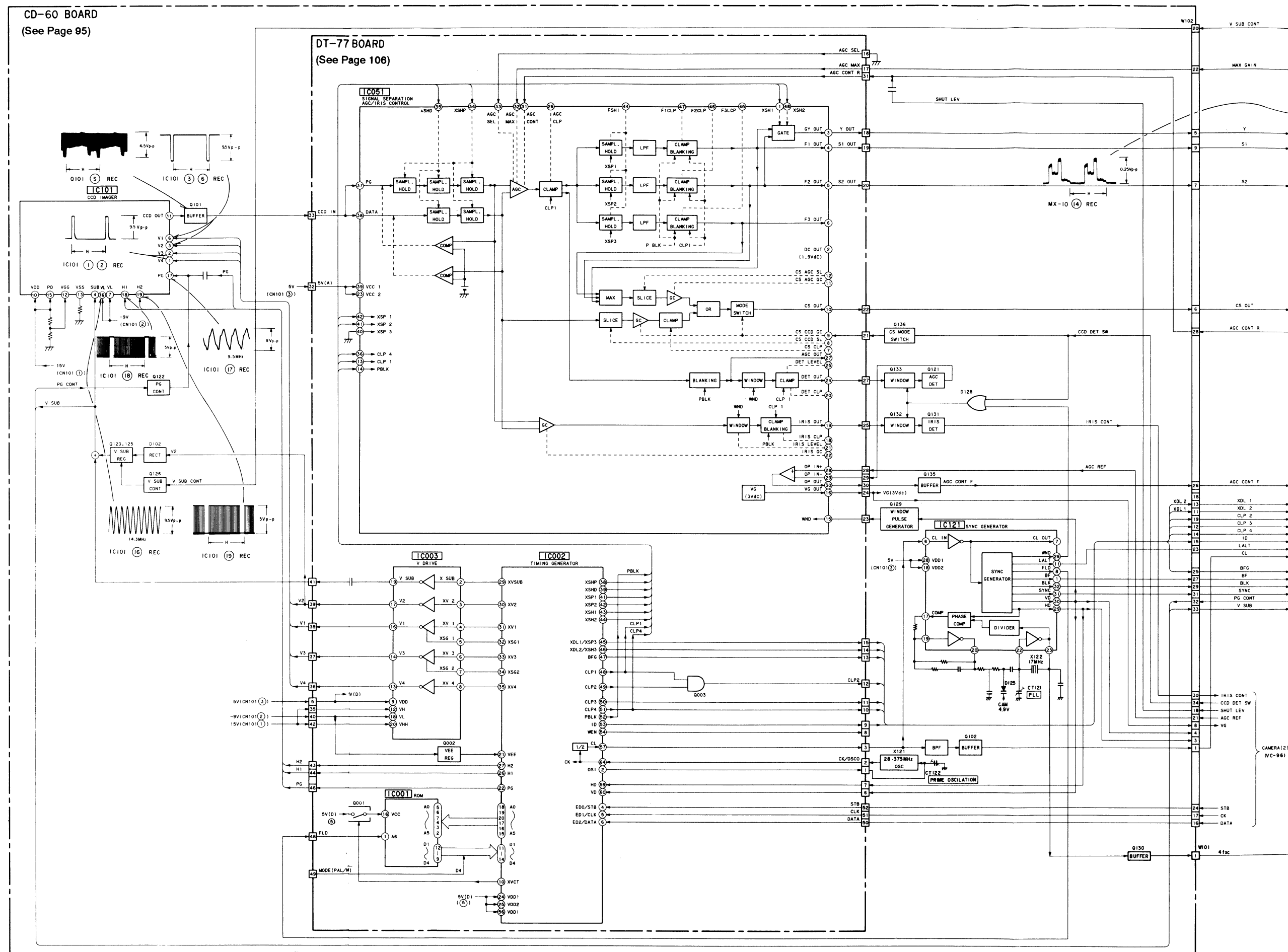
3-2. OVERALL BLOCK DIAGRAM



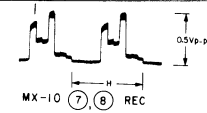


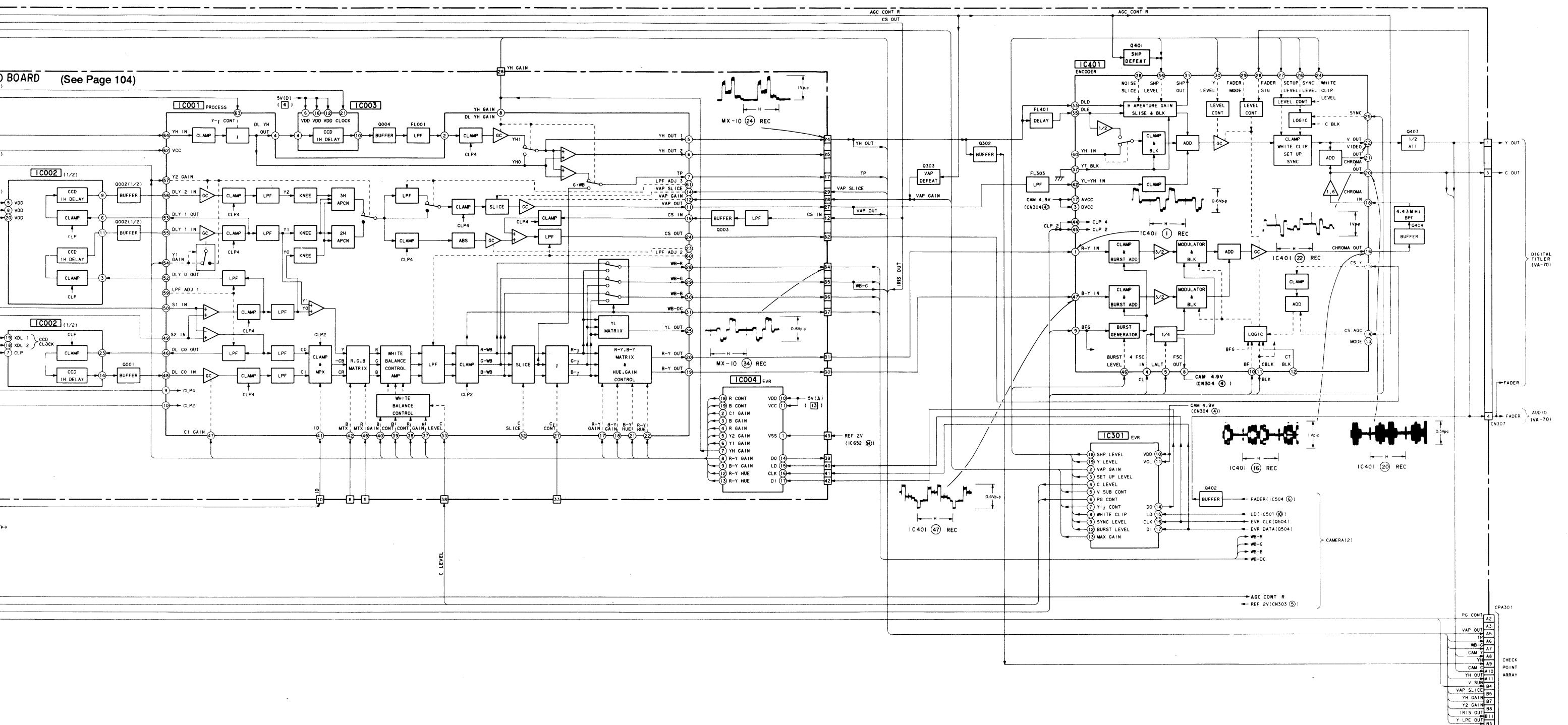
3-3. CAMERA (i) BLOCK DIAGRAM

CD-60 BOARD
(See Page 95)



VC-96 BOARD(1/2)





3-4. CAMERA SYSTEM CONTROL VC-96 BOARD IC501 (MC68HC11E9)

[Description]

MC68HC11E9 is a 8-bit one-chip micro computer with a built-in nonvolatile memory (EEPROM). The camera system is controlled by this micro computer. In addition, protocol master control of the LANC communication can be performed.

1. Function

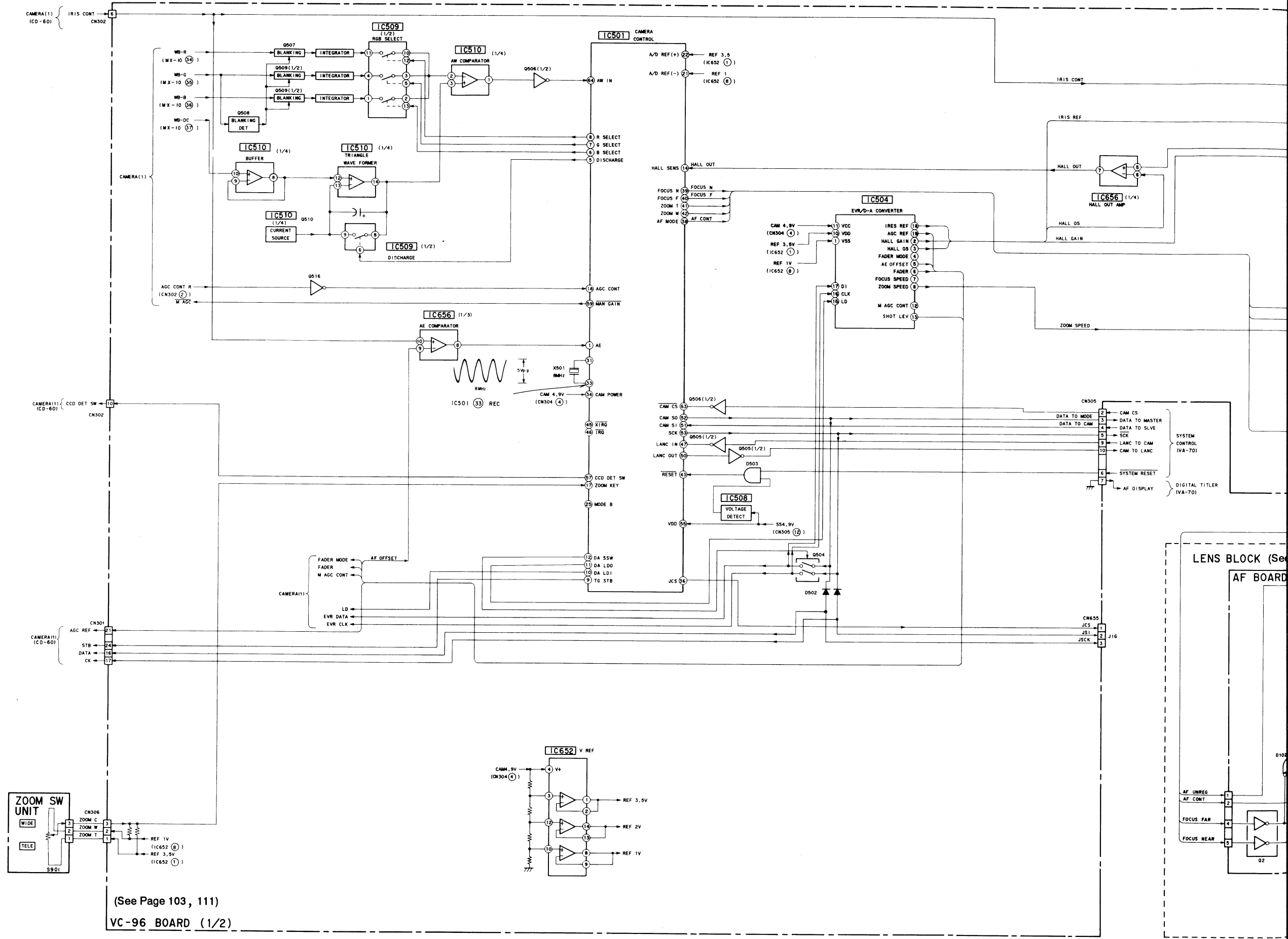
- 1) EVR Control
- 2) AWB Control
- 3) AE Control
- 4) LANC communication protocol control

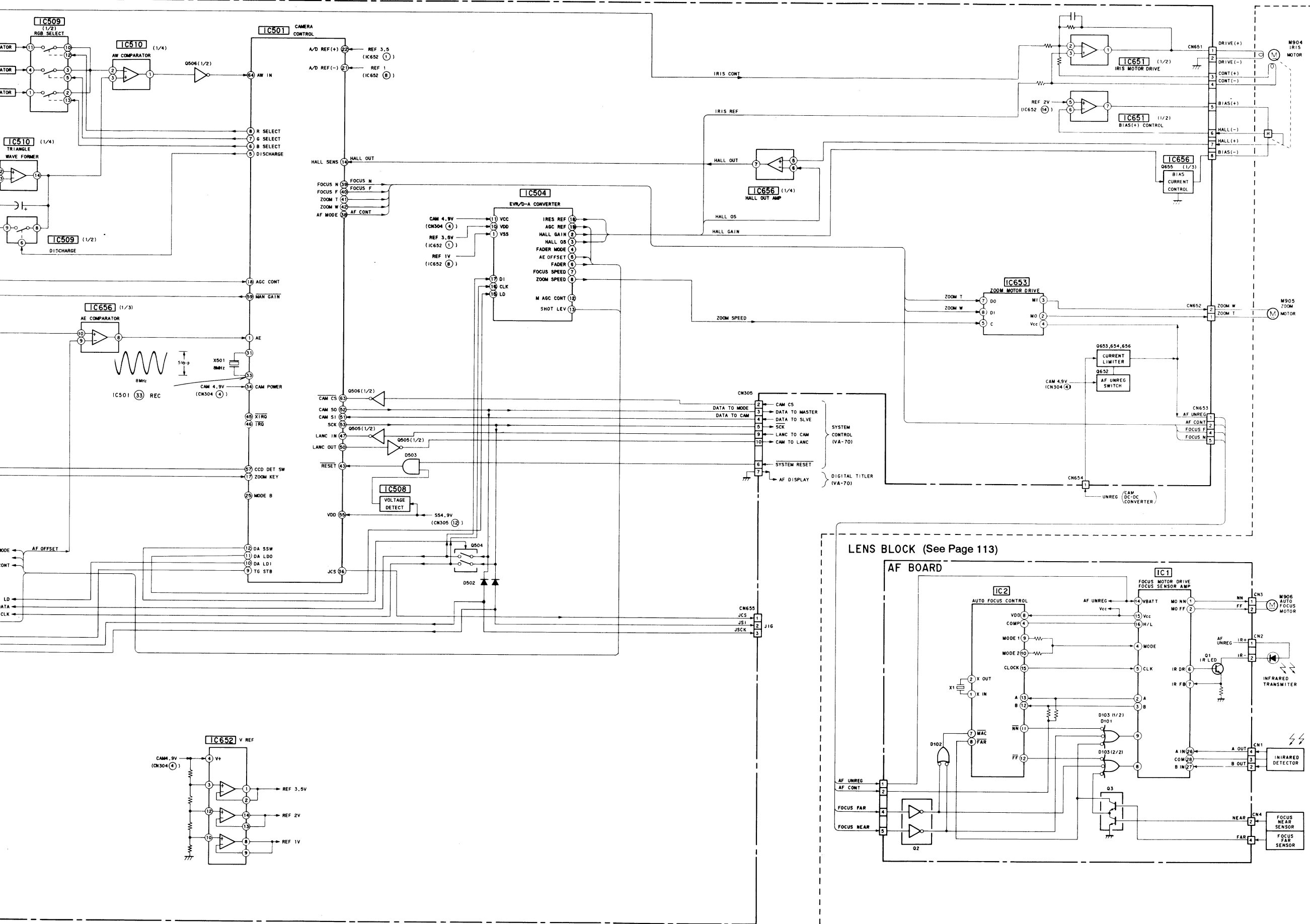
2. Pin Description

Pin No.	Signal Name	I/O	Function
1	AE	I	—
2	NC	—	—
3	NC	—	—
4	NC	—	—
5	DIS CHG	O	AWB. AE Integration-type A/D reset pulse
6	B SELECT	O	AWB Instrumentation line select pulse (blue)
7	G SELECT	O	AWB Instrumentation line select pulse (green)
8	R SELECT	O	AWB Instrumentation line select pulse (red)
9	TG STB	O	Strobe signal for timing generator (IC002 on DT-77)
10	DA LD1	O	Load pulse for D/A converter (IC301 on MX-10)
11	DA LD0	O	Load pulse for D/A converter (IC504)
12	DA SSW	O	Switching pulse output for communication bus line.
13	F SENS1	I	—
14	HALL SENS	I	—
15	ZOOM SENS	I	—
16	AN5	I	—
17	ZOOM KEY	I	Zoom switch voltage input (Analog input)
18	AGC CONT	I	AGC voltage input (Analog input)
19	F SENS2	I	—
20	AE IN	I	AE Integration-type A/D converter comparator input
21	A/D REF (-)	—	Built-in A/D converter the minimum standard voltage (Analog input)
22	A/D REF (+)	—	Built-in A/D converter the minimum standard voltage (Analog input)
23	V _{ss}	—	GND
24	V _{ss}	—	GND
25	MODE B	I	Pull up to SS 4.9V
26	NC	—	—
27	MODE A	I	Pull down to GND
28	STR A	—	—
29	E	—	—
30	STR B	—	—
31	EXTAL	$\bar{O}$	Built-in inverter output for oscillating element
32	NC	—	—

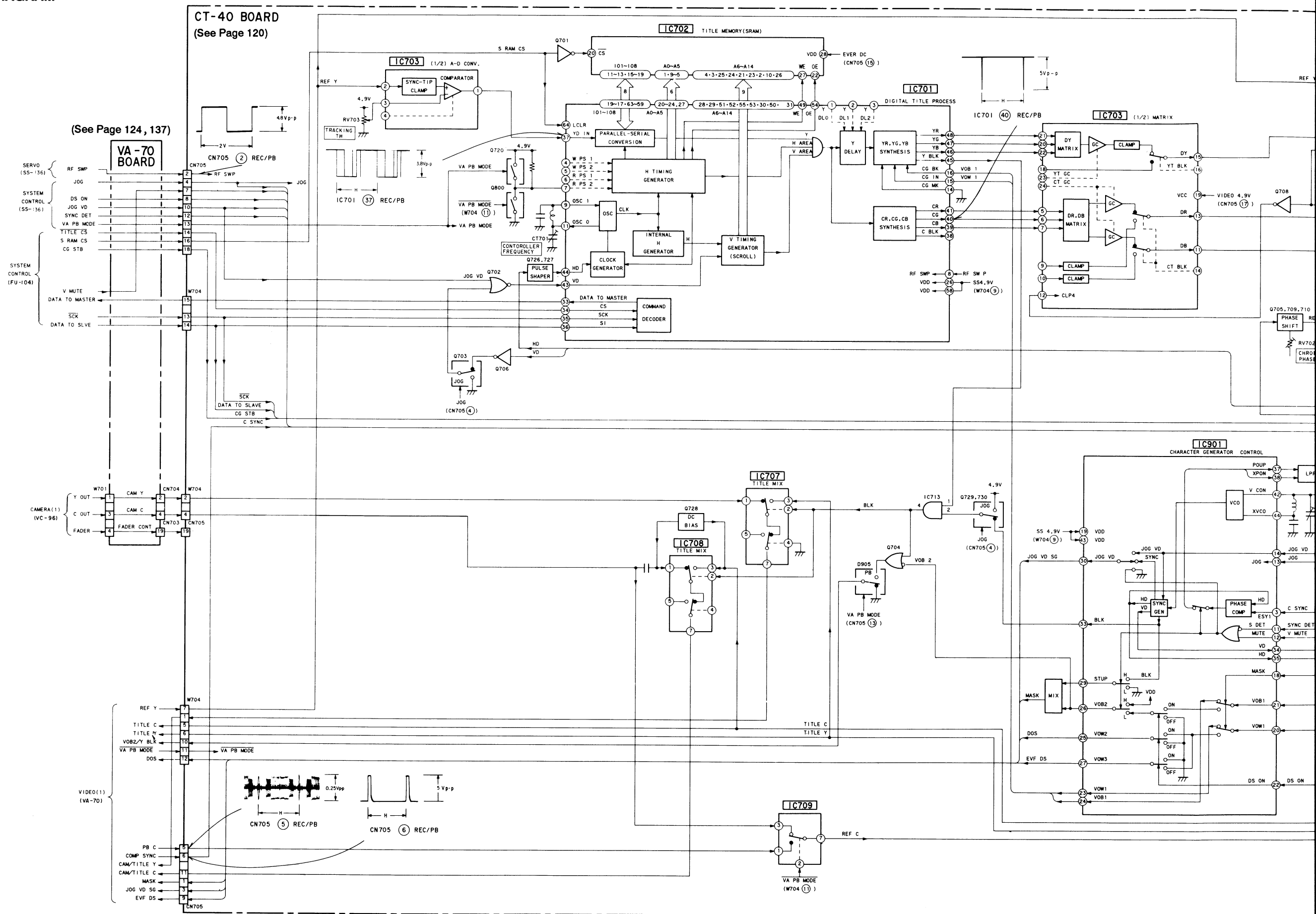
Pin No.	Signal Name	I/O	Function
33	XTAL	I	Built-in inverter input for oscillating element
34	CAM POWER	I	Camera power source rise supervision
35	NC	—	—
36	JCS	O	—
37	PC2	—	—
38	AF MODE	O	AUTO FOCUS ON/OFF select
39	FOCUS N	O	Focus motor N-direction rotating designation
40	FOCUS F	O	Focus motor ∞ -direction rotating designation
41	ZOOM T	O	Zoom motor T-direction rotating designation
42	ZOOM W	O	Zoom motor W-direction rotating designation
43	RESET	I	Reset
44	NC	—	—
45	$\overline{\text{XIRQ}}$	I	Pull up to SS 4.9V
46	$\overline{\text{IRQ}}$	I	Pull up to SS 4.9V
47	LANC IN	I	LANC input
48	NC	—	—
49	V _{SS}	—	GND
50	LANC OUT	O	LANC output
51	CAM SI	I	Serial data input
52	CAM SO	O	Serial data output
53	SCK	O	Serial clock
54	SENS DRIVE	O	—
55	V _{DD}	—	SS 4.9V
56	FADER B/W	O	Fader mode black/white select
57	PA6	O	CCD DET switch select
58	OC3	—	—
59	$\overline{\text{MAN GAIN}}$	O	AGC system automatic/manual select
60	NC	—	—
61	NC	—	—
62	$\overline{\text{MAN IRIS}}$	O	IRIS system automatic/manual select
63	$\overline{\text{CAM CS}}$	I	Camera chip select input
64	$\overline{\text{AW IN}}$	I	AWB Integration-type A/D converter comparator input

3-5. CAMERA (2) BLOCK DIAGRAM



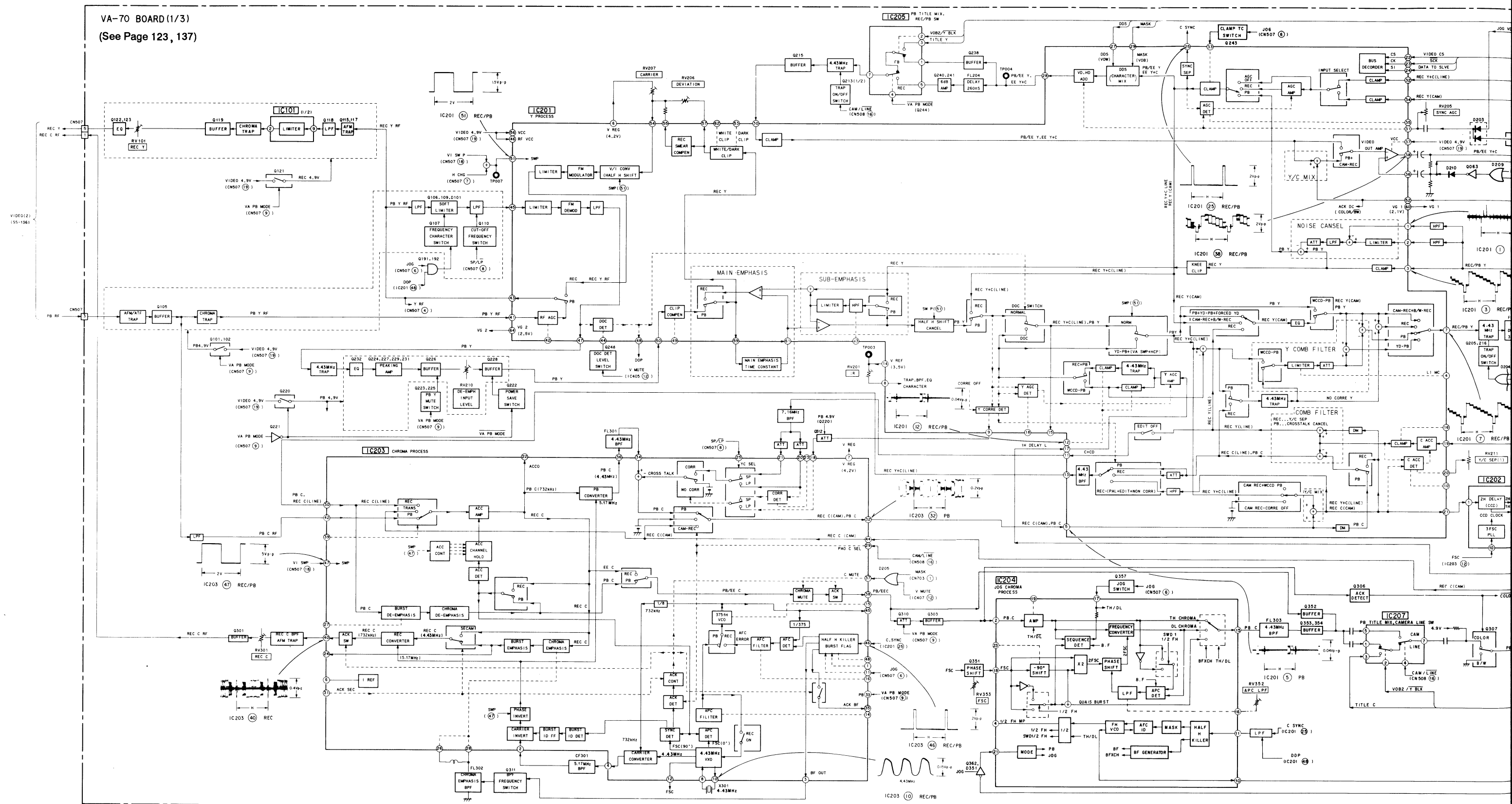


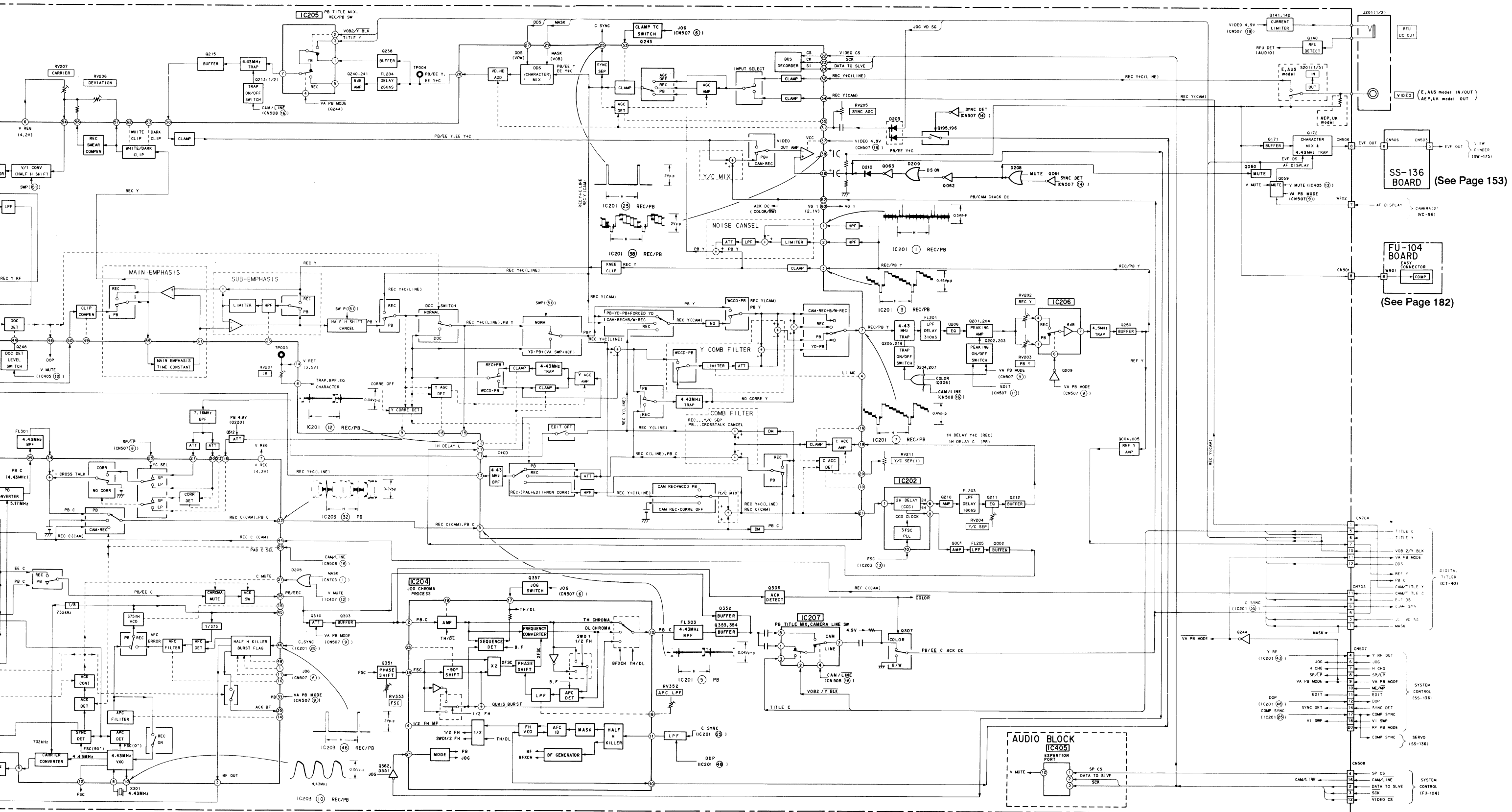
3-6. TITLER BLOCK DIAGRAM



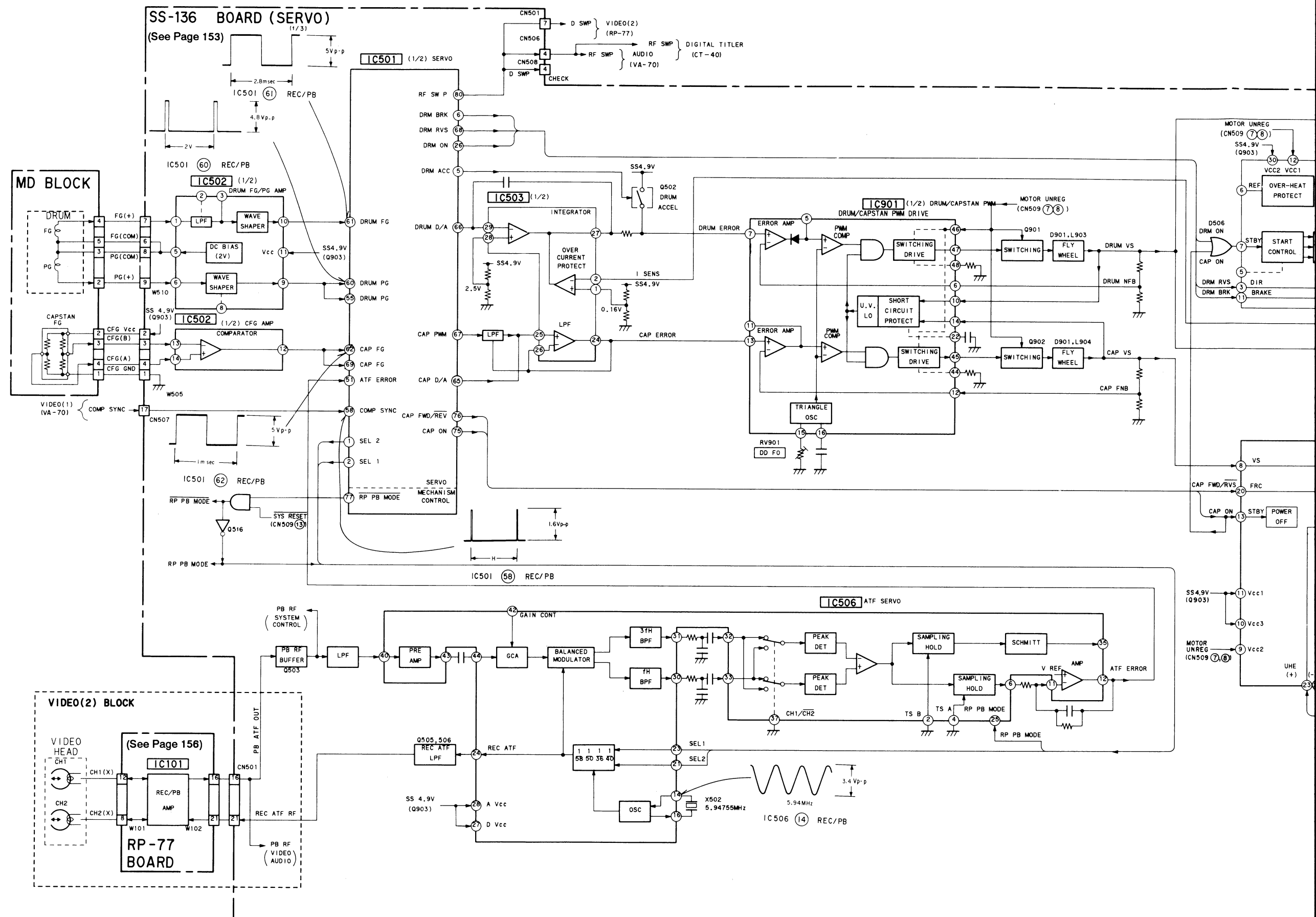
3-7. VIDEO (1) BLOCK DIAGRAM

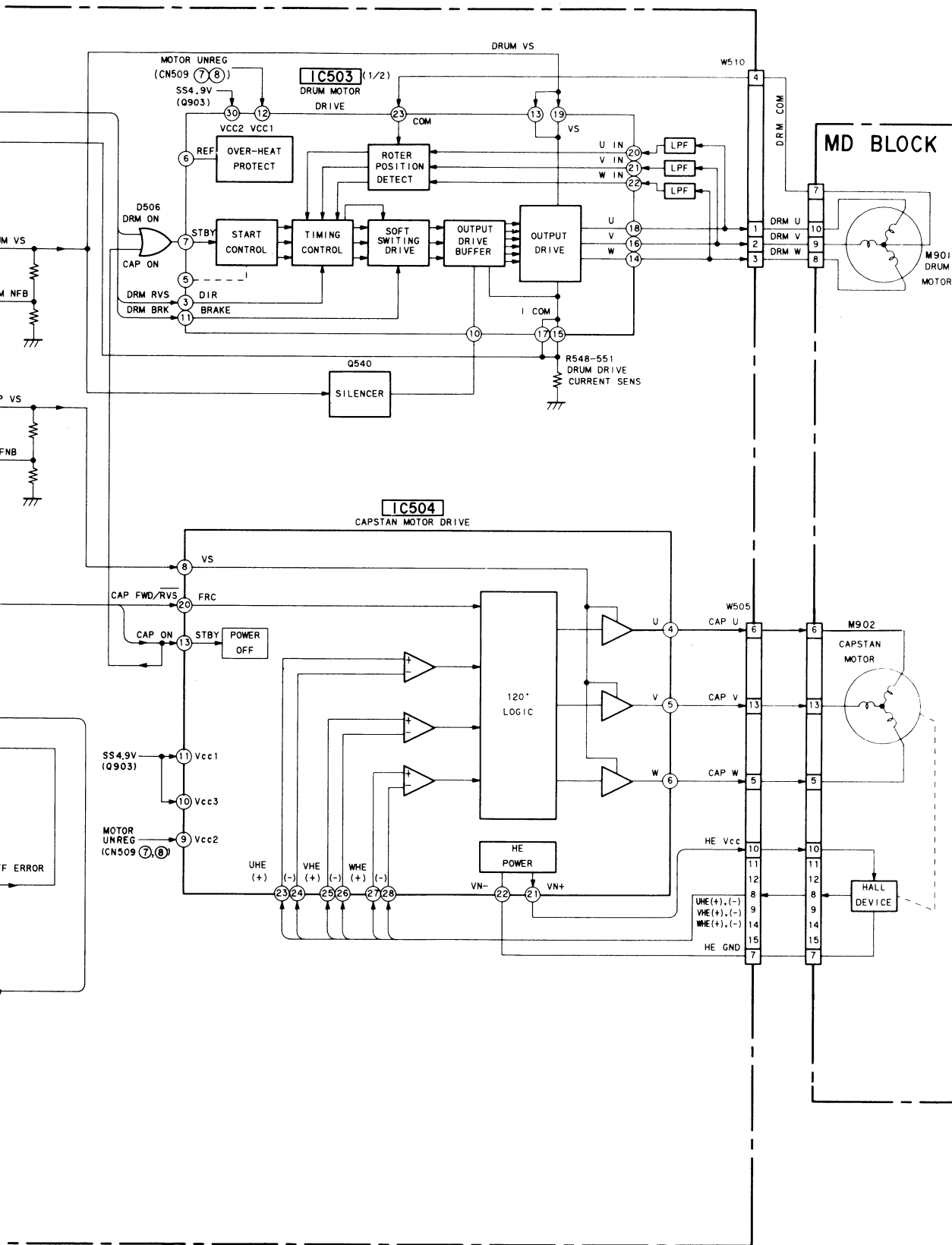
VA-70 BOARD (1/3)
(See Page 123, 137)



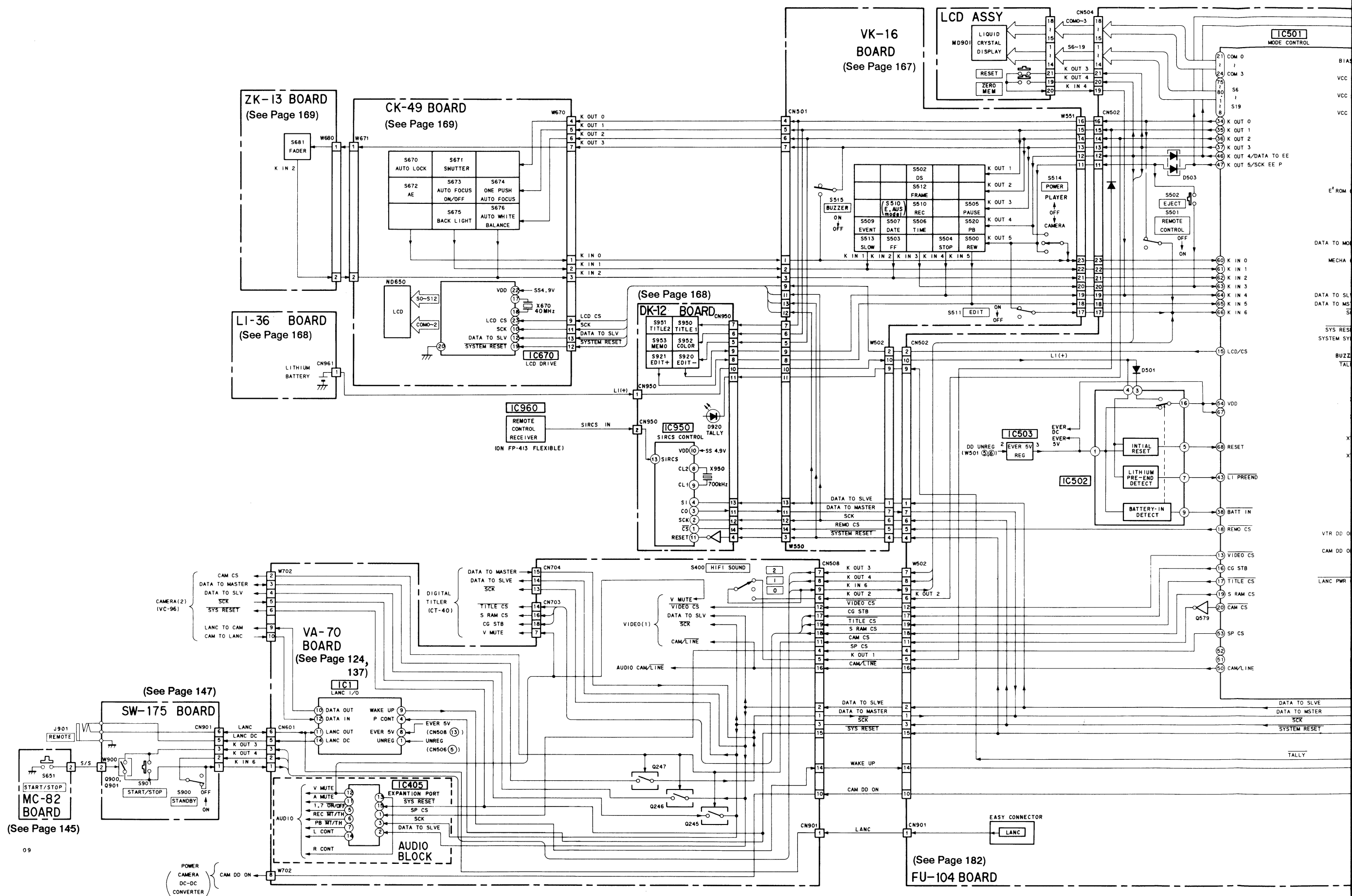


3-9. SERVO BLOCK DIAGRAM





3-10. SYSTEM CONTROL BLOCK DIAGRAM



3-11. MODE CONTROL SYSTEM IC TERMINAL FUNCTION DESCRIPTION FU-104 BOARD IC501
(μ PD75316)

Pin No.	Port Name	Function	I/O	Connection	Signal Name
1	S12	Segment signal output	O	LCD	S12
2	S13	Output (Four value output of 0, 1.7, 3.3, 5V) Segment terminal drive to LCD	O	LCD	S13
3	S14		O	LCD	S14
4	S15		O	LCD	S15
5	S16		O	LCD	S16
6	S17		O	LCD	S17
7	S18		O	LCD	S18
8	S19		O	LCD	S19
9	S20	Not used	O	LCD	
10	S21	Not used	O	LCD	
11	S22	Not used	O	LCD	
12	S23	Not used	O	LCD	
13	S24/BP0	Chip select signal to video IC (CXA1207) 1V period "L" pulse	O	VA-70	VIDEO CS
14	S25/BP1	Chip select signal to SS-136P board IC501 (CXP80116) 1V period "L" pulse	O	SS-136P IC501	MECHA CS
15	S26/BP2	Chip select signal to LCD driver (M34206) 1V period "L" pulse	O	CK-49, IC670	LED CONT
16	S27/BP3	Strobe signal for character generator (μ PD6451) 1V "H" pulse train	O	VA-70	CG STB
17	S28/BP4	Chip select to titler (CF79028) 1V "L" pulse	O	CT-40	TITEL CS
18	S29/BP5	Chip select to SIRCS remote control (μ PD7564) 1V "L" pulse	O	DK-12P	REMO CS REMOTE CONTROL
19	S30/BP6	Chip select to SRAM "H" when using title. Normally, "L"	O	CT-40	S RAM CS
20	S31/BP7	Chip select to camera μ COM 1V period "H" pulse	O	CAMERA	CAM CS
21	COM0	LCD to common signal output Common terminal drive output	O	LCD	COM0
22	COM1		O	LCD	COM1
23	COM2		O	LCD	COM2
24	COM3		O	LCD	COM3
25	BIAS	Output terminal for outside dividing resistance cut Power input	O	FU-104	BIAS
26	VLC0	Power source for LCD drive, 3V in backup Power source 0 input terminal	I	FU-104	VLC0
27	VLC1	Power source for LCD drive, 3V in backup Power source 1 input terminal	I	FU-104	VLC1
28	VLC2	Power source for LCD drive, 3V in backup Power source 2 input terminal	I	FU-104	VLC2
29	P40	SS 5V, VTR 5V power source detection. "H" when VTR power source is turned on.	O	VA-70	VTR DD ON
30	P41	CAM 5V power source detection	O	CAMERA	CAM DD ON

Pin No.	Port Name	Function	I/O	Connection	Signal Name
31	P42	Output port to reset each IC when power is turned on	O	all	SYS RESET
32	P43	External tally and internal tally drive port	O	VA-70, DK-12P	TALLY
33	Vss	GND			Vss
34	P50	L active KEY matrix output port	O	all	K OUT0
35	P51		O	all	K OUT1
36	P52		O	all	K OUT2
37	P53		O	all	K OUT3
38	P00/INT4	Clock select to 32 kHz with "L" and to 4.19 MHz with "H" When Battery is turned on, "L" is select	I	FU-104	BATT IN
39	P01/SCK	Serial clock input-output terminal Serial clock (2 μ S) communication	O	all	SCK
40	P02/SO/SB0	Serial clock input-output terminal Serial clock (2 μ S) communication	O	all	DATA TO SLV
41	P03/SI/SB1	Serial bus input terminal Serial clock (2 μ S) communication	I	all	DATA TO MASTER
42	P10/INT0	(Edge detection vector interruption) System synchronization input port from CXD80116	I	SS-136P IC501	SYSTEM SYNC
43	P11/INT1	(Edge detection vector interruption) Lithium PRE END is selected with "L"	I	FU-104	LI PRE END
44	P12/INT2	STABY release input Release STANDBY with "L"	I	VA-70	LANC PWR ON
45	P13/TIO	E ² PROM serial communication data input EE PROM communication KEY matrix OUT is combined	I	SS-136P IC508	DATA TO MODE
46	P20/PT00	E ² PROM serial communication data input, EE PROM communication KEY matrix OUT is combined	O	SS-136P IC508	KOUT4/DATA TO EE
47	P21	E ² PROM serial communication clock output key matrix output EE PROM communication KEY matrix OUT is combined.	O	SS-136P, VK-16P IC508	KOUT5/ SCK EE
48	P22/PCL	Chip select to E ² PROM	O	SS-136P IC508	EE PROMCS
49	P23/BUZ	BUZZER output	O	SS-136P	BUZZER
50	P30/LCDCL	CAMERA/LINE select output Camera mode is selected with "H", VTR is selected with "L"	O	VA-70	CAM/LINE
51	P31/SYNC	Not used	O	VA-70	V MUTE
52	P32		O	VA-70	A MUTE
53	P33	Chip select to serial/parallel IC	O	VA-70	SP CS
54	VDD	VE 3V/5V power source terminal		FU-104	VDD
55	XT1	Sub system clock	I	FU-104	XT1
56	XT2	32 kHz oscillation terminal	I	FU-104	XT2
57	NC			-	NC
58	X1	Main system clock 4.19 MHz oscillation terminal	I	FU-104	X1
59	X2		I	FU-104	X2
60	P60/KK0	KEY matrix input terminal 18 msec period normally "H" Input-Output is possible by bit Pull-up from software is possible by 4-bit	I	all	K IN 0
61	P61/KR1		I	all	K IN 1
62	P62/KR2		I	all	K IN 2
63	P63/KR3		I	all	K IN 3

Pin No.	Port Name	Function	I/O	Connection	Signal Name
64	P70/KR4	KEY matrix input terminal 18 msec period normally "H" 4-bit input-Output port Pull-up from software is possible by 4-bit	I	all	K IN 4
65	P71/KR5		I	all	K IN 5
66	P72/KR6		I	all	K IN 6
67	P73/KR7		I	all	K IN 7
68	RESET	System reset input Reset input terminal of microcomputer	I	all	RESET
69	S0	Segment signal output terminal not used	O		
70	S1		O	LCD	
71	S2		O	LCD	
72	S3		O	LCD	
73	S4		O	LCD	
74	S5		O	LCD	
75	S6	LCD segment signal output terminal (Four value output of 0, 1.7, 3.3, 5V)	O	LCD	
76	S7		O	LCD	
77	S8		O	LCD	
78	S9		O	LCD	
79	S10		O	LCD	
80	S11		O	LCD	

3-12. SERVO, SYSTEM CONTROL SYSTEM TERMINAL FUNCTION SS-136P BOARD IC501 (CXP80116)

Pin No.	Signal Name	I/O	Function	Connection															
1	SEL2	O	ATF REF PILOT signal frequency control <table><tr><td>ATF REF PILOT</td><td>f1</td><td>f2</td><td>f3</td><td>f4</td></tr><tr><td>SEL 1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL 2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table>	ATF REF PILOT	f1	f2	f3	f4	SEL 1	H	L	H	L	SEL 2	H	H	L	L	ATF IC CXA1204Q
ATF REF PILOT	f1	f2		f3	f4														
SEL 1	H	L		H	L														
SEL 2	H	H	L	L															
2	SEL1	O																	
3	DS ON	O	Data Screen ON/OFF control Data Screen ON and Data Screen key are selected with "H"	VIDEO block															
4	VI SWP	O	RF SWP using for Video system Normally, same as RF SWP When using 'CH only "H" 3 Head is used	VIDEO block															
5	DRM ACC	O	DRUM motor acceleration signal Acceleration is selected with "H"	To Drum motor driver CXA8006M															
6	DRM BLK	O	DRUM motor brake signal Brake is selected with "H"	To Drum motor driver CXA8006M															
7	JOG	O	Normal/JOG mode recognition signal JOG is selected with "H"	R/P Amp VIDEO block															
8	FE RA	-	Not used	---															
9	FE RS	-																	
10	H CHG	O	2CH or 'CH select signal 'CH is selected with "H" Only 3 Head is used	VIDEO system R/P Amp															
11	SYSTEM SYNC	O	Internal bus communication synchronizing signal (V synchronization)	Mode controller															
12	SP/LP	O	SP/LP mode recognition signal SP mode is selected with "H"	R/P Amp VIDEO/AUDIO block															
13	NOR/Hi8	O	Not used. Normally, "L"	---															
14	VA PB MODE	O	VIDEO/AUDIO system REC/PB mode select PB mode is selected with "H"	VIDEO/AUDIO block															
15	UNLOAD	O	Loading motor control signal <table><tr><td></td><td>OFF</td><td>LOADING</td><td>UNLOADING</td><td>BRAKE</td></tr><tr><td>LOAD</td><td>L</td><td>H</td><td>L</td><td>H</td></tr><tr><td>UNLOAD</td><td>L</td><td>L</td><td>H</td><td>H</td></tr></table>		OFF	LOADING	UNLOADING	BRAKE	LOAD	L	H	L	H	UNLOAD	L	L	H	H	To loading block
	OFF	LOADING		UNLOADING	BRAKE														
LOAD	L	H		L	H														
UNLOAD	L	L	H	H															
16	LOAD	O																	
17	CAP ON2	-	Not used	---															
18	AF REC	-																	
19	ME/MP	I	ME/MP tape recognition input ME tape is selected with "H"	To CC-61 board															
20	MP HG	I	MP HG tape recognition input MPHG is selected with "L"	To CC-61 board															
21	REC PROOF	I	REC PROOF recognition input REC PROOF is selected with "L"	To CC-61 board															
22	MODE SW2	I	Mechanical position input	To CC-61 board															
23	MODE SW1	I																	
24	MODE SW0	I																	
25	CC DOWN	I	Cassette IN switch input Cassette IN is selected with "L"	To CC-61 board															
26	DRM ON	O	Drum motor drive control Motor Drive is selected with "H"	To Drum motor driver CXA8006M															

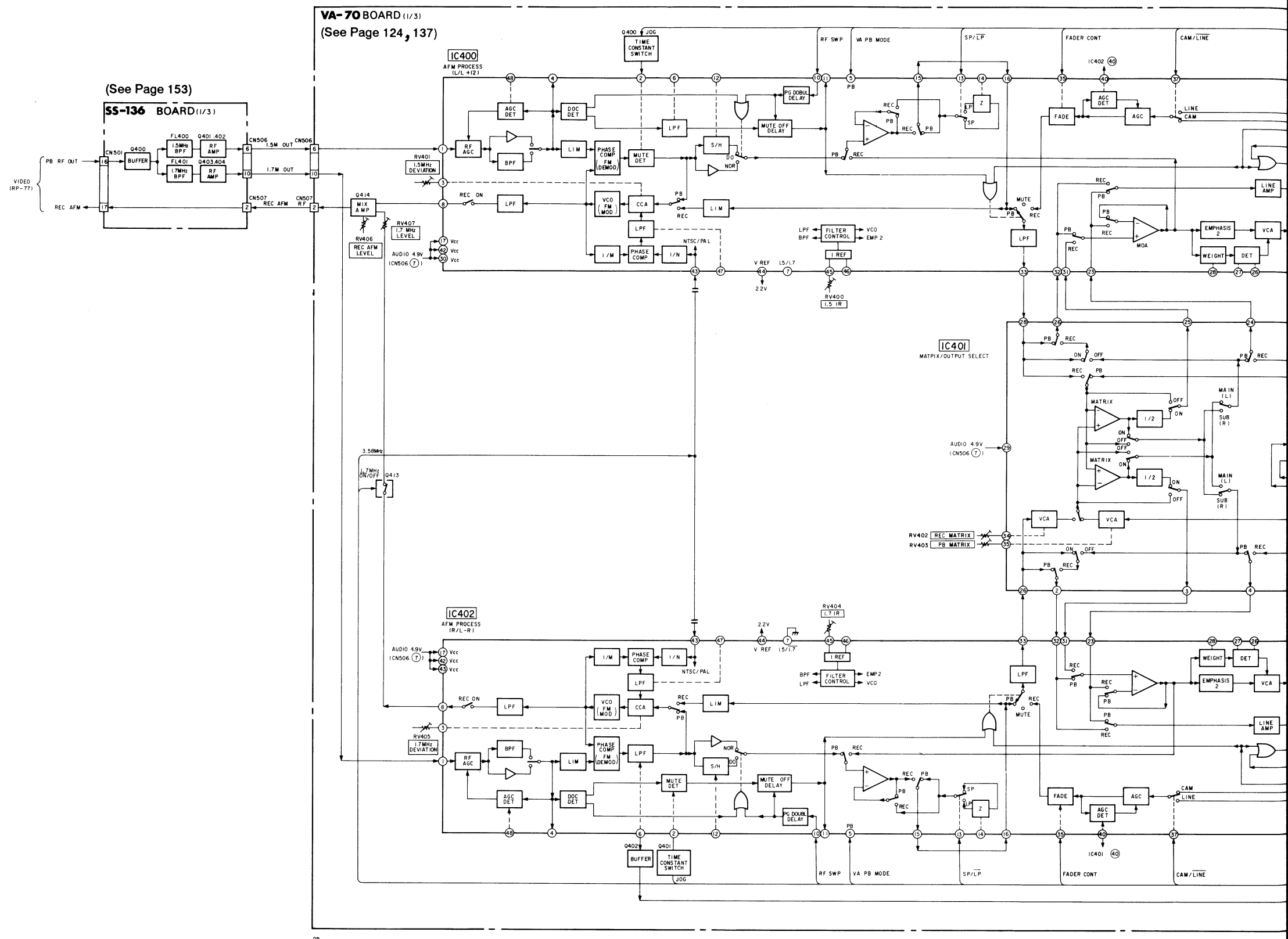
Pin No.	Signal Name	I/O	Function	Connection
27	T/E LED	O	LED for tape top end sensor drive control LED Flashing is selected with "H"	To CC-61 board
28	REEL LED	O	LED for reel sensor drive control LED Flashing is selected with "L"	To CC-61 board
29		—	Not used	—
30	EDIT	O	EDIT ON/OFF control EDIT is selected with "L" and interlocked with EDIT key	To VIDEO block
31	SS GND	—	—	—
32	SYSTEM RESET	I	Control by mode controller with RESET terminal of this microcomputer RESET is selected "L"	Mode controller and others
33	SS GND	—	—	—
34	16M OUT	O	Crystal connecting terminal for system clock oscillation (16 MHz)	X'tal (X501)
35	16M IN	I		
36	COSMO CS	I	Select signal of this microcomputer from internal bus communication mode controller Selected with "L"	Mode controller
37	DATA TO SLVE	I	Serial data input terminal	Mode controller
38	DATA TO MSTR	O	Serial data output terminal	Mode controller
39	SCK	I	Serial clock input terminal	Mode controller
40	PCM ACT	—	Not used	—
41	Hi8 DET	—	Not used. Normally, "L"	—
42	S IN	—	Not used. Normally, "H"	—
43	MONO/ST DET	I	AFM monaural/stereo recognition input Stereo is selected "H" (Only stereo correspondence model)	To AUDIO block
44	TOP SENS	I	Tape top end sensor input TOP is selected with "H" END is selected with "H"	To CC-61 board
45	END SENS	I		
46	T REEL FG	I	Reel sensor input Take up side	To CC-61 board
47	S REEL FG	I	Reel sensor input Supply side	To CC-61 board
48	BATT SENS	I	Battery input voltage sense	—
49	DEW SENS	I	DEW SENSOR input	DEW SENSOR
50	THERMISTOR	I	THERMISTOR input (This model: fixed valor)	
51	ATF ERROR	I	ATF error (ATF LOCK error) input A/D input terminal	SS-136P IC506 ⑫
52	SS GND	—	—	—
53	SS 4.9V		Power source supply terminal	
54	SS 4.9V			
55	DRM PG	I	DRUM PG input FRC (high precision timer) capture input terminal	SS-136P IC502 ⑨
56	HiFi/WIND	I	MIC HiFi/WIND input. HiFi is selected with "L", WIND is selected with "H"	To AUDIO block
57	CLOG	I	Clog detection signal input. CLOG is selected with "H"	SS-136P Q510 ③
58	COMP SYNC	I	Composite SYNC (composite synchronizing signal) input. (built-in V SYNC separator)	To VIDEO block
59	SP/LP DET	I	SP/LP recognition signal input	SS-136P Q511 ③

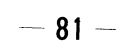
Pin No.	Signal Name	I/O	Function	Connection
60	DRM PG	—	—	—
61	DRM FG	I	DRUM FG input terminal FRC capture input terminal	SS-136P IC502 ⑩ Sense Amplifier
62	CAP FG	I	CAPSTAN FG input terminal FRC capture input terminal	SS-136P IC502 ⑫ Sense Amplifier
63	MONO/ST	—	Not used	—
64	SYNC DET	I	With/Without VIDEO signal recognition signal input	To VIDEO block
65	CAP D/A	O	DA gate pulse output terminal for CAP ERROR output Servo exclusive output terminal (DA mode)	To capstan lowpass filter
66	DRM D/A	O	DA gate pulse output terminal for DRUM ERROR output Servo exclusive output terminal (DA mode)	To drum lowpass filter
67	CAPPWM	O	PWM output terminal for CAP ERROR output Servo exclusive output terminal (PWM mode)	Capstan driver SS-136P IC503
68	DRM RVS	O	DRUM rotating direction control signal RVS is selected with "H" FWD is selected with "L"	SS-136P IC503 ③
69	CAP FG	I	External event input terminal to CAP FG input terminal exclusive counter for TAPE COUNTER drive	SS-136P IC502 ⑫ Sense Amplifier
70	MIC JACK MONO/ST	I	External MIC Monaural/stereo recording signal Monaural is selected with "H".	To AUDIO block
71	SS 4.9V			
72	SS 4.9V			
73	SS GND	—	—	—
74	—	—	Not used	—
75	CAP ON	O	Capstan driver ON control signal	SS-136P IC504 ⑬ Capstan driver
76	CAP FWD/REV	O	Capstan rotating direction control signal, FWD is selected with "H", RVS is selected with "L"	SS-136P IC504 ⑭ Capstan driver
77	RP PB MODE	O	REC/PB mode select signal of RP amplifier and ATF IC	SS-136P Q516 ⑤
78	FE ON	O	Flying erase oscillatio ON/OFF signal Oscillation is selected with "H"	To RP-77 Amp
79	JOG VD	O	Artificial VD output terminal input to VIDEO signal in varying speed playback	To VIDEO block
80	RF SWP	O	RF SWP output terminal	RP block VIDEO/AUDIO block

VIDEO (RP-77) { PB RF OUT
REC AFM

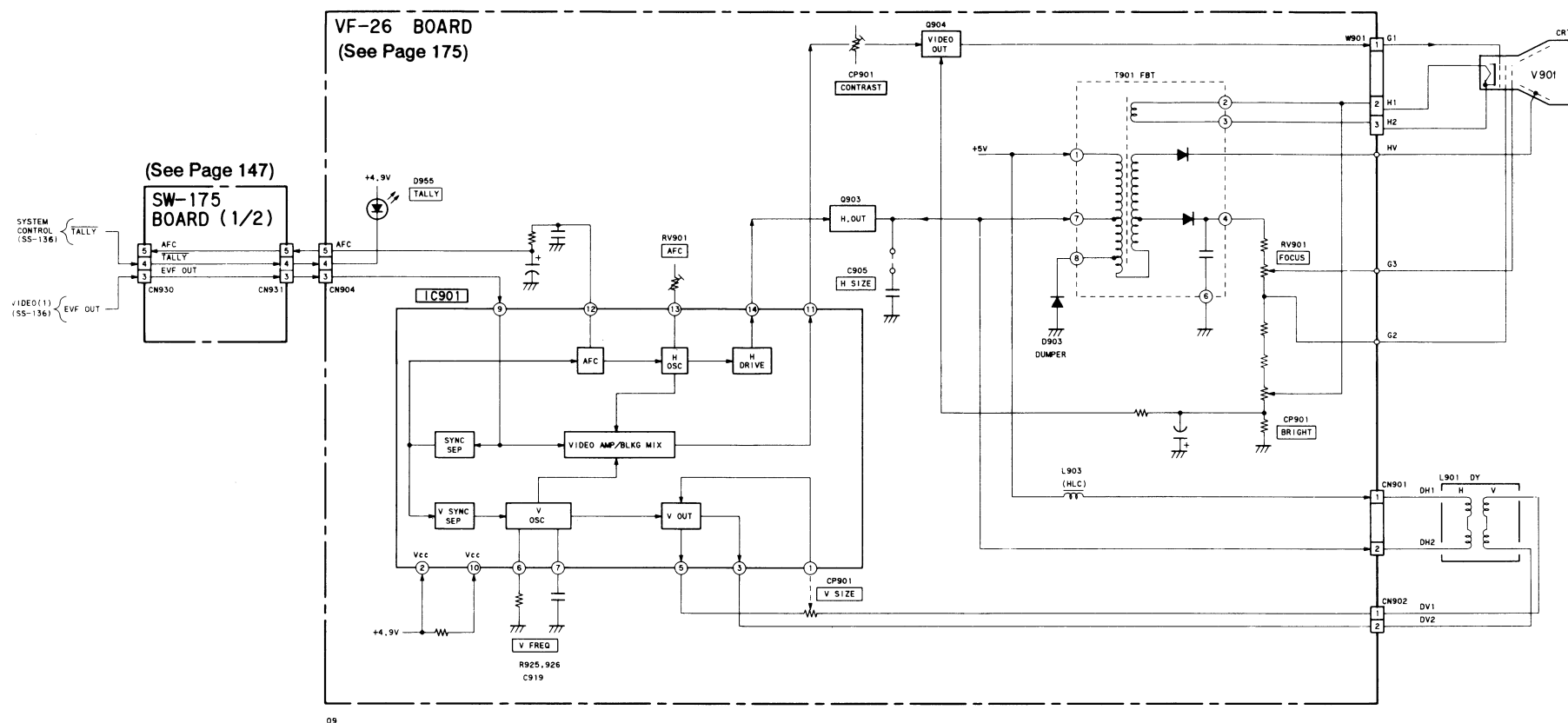
Function	Connection
input terminal	SS-136P IC502 ⑩
e input terminal	Sense Amplifier
FG input terminal	SS-136P IC502 ⑫
e input terminal	Sense Amplifier
ut VIDEO signal recognition signal input	To VIDEO block
lse output terminal for CAP ERROR output	To capstan lowpass filter
sive output terminal (DA mode)	
lse output terminal for DRUM ERROR output	To drum lowpass filter
sive output terminal (DA mode)	
ut terminal for CAP ERROR output	Capstan driver
sive output terminal (PWM mode)	SS-136P IC503
ting direction control signal	SS-136P IC503 ③
lected with "H"	
lected with "L"	
ent input terminal to CAP FG input terminal exclusive	SS-136P IC502 ⑫
TAPE COUNTER drive	Sense Amplifier
C Monaural/stereo recording signal	To AUDIO block
is selected with "H".	
er ON control signal	SS-136P IC504 ⑬
Capstan driver	
ting direction control signal,	SS-136P IC504 ⑭
ected with "H", RVS is selected with "L"	Capstan driver
de select signal of RP amplifier and ATF IC	SS-136P Q516 ⑥
oscillatio ON/OFF signal	To RP-77 Amp
s selected with "H"	
output terminal input to VIDEO signal in varying speed	To VIDEO block
put terminal	RP block
VIDEO/AUDIO block	

3-13. AUDIO BLOCK DIAGRAM

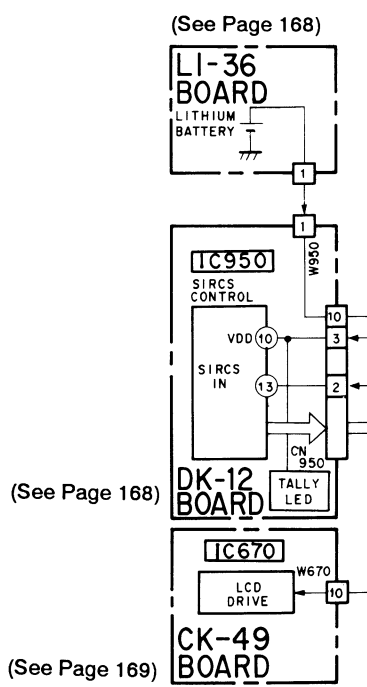
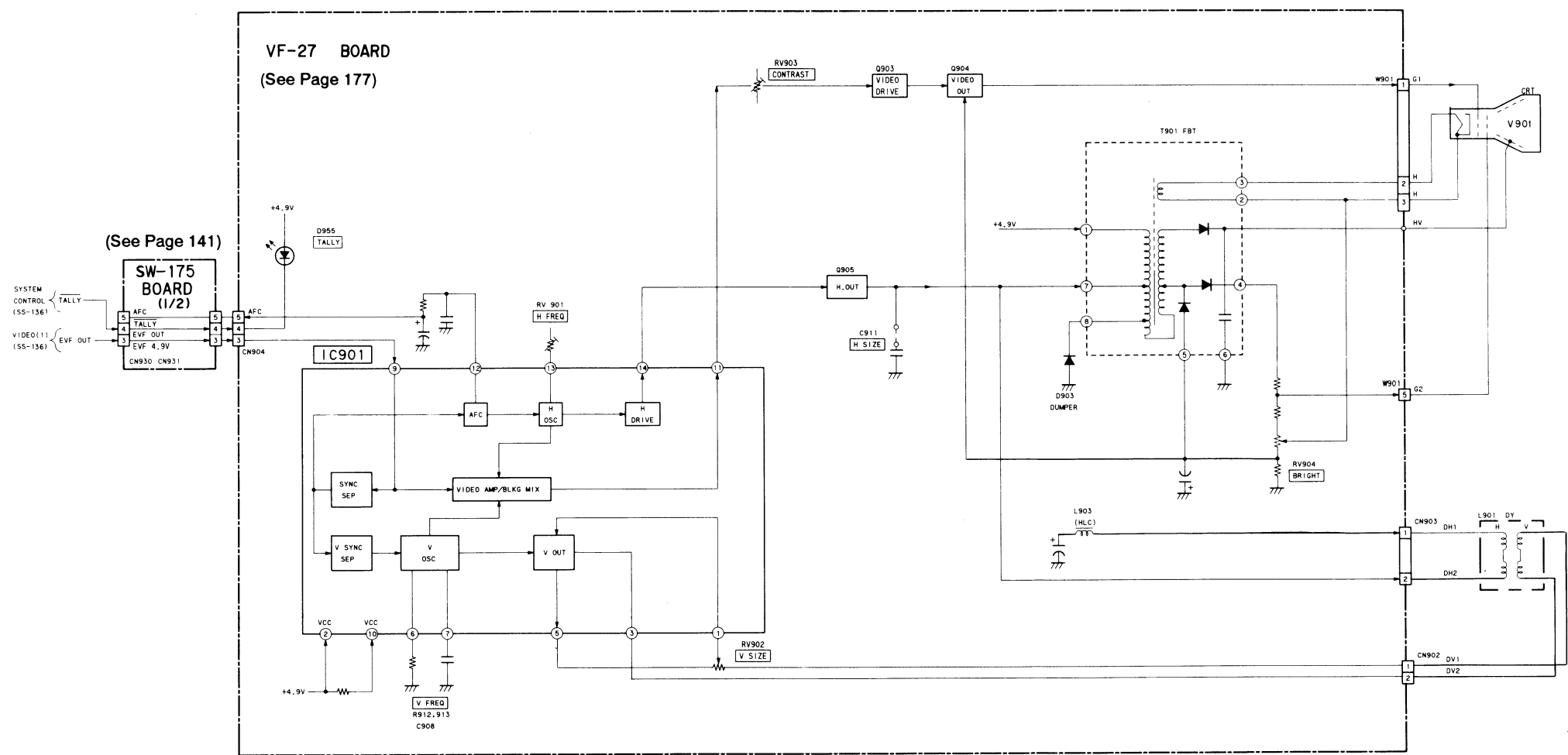




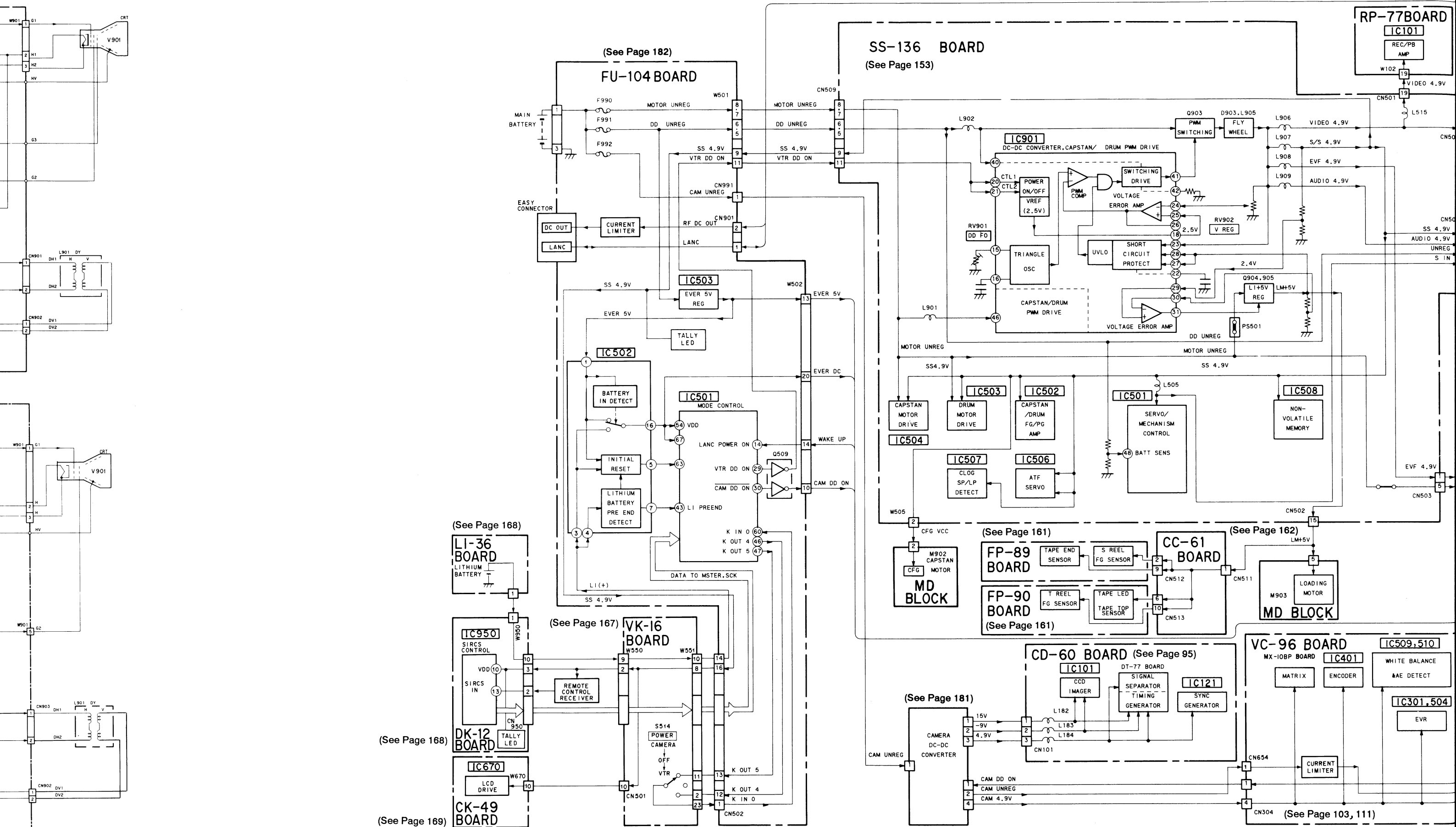
3-14. ELECTRICAL VIEWFINDER BLOCK DIAGRAM



3-15. POWER BLOCK DIAGRAM

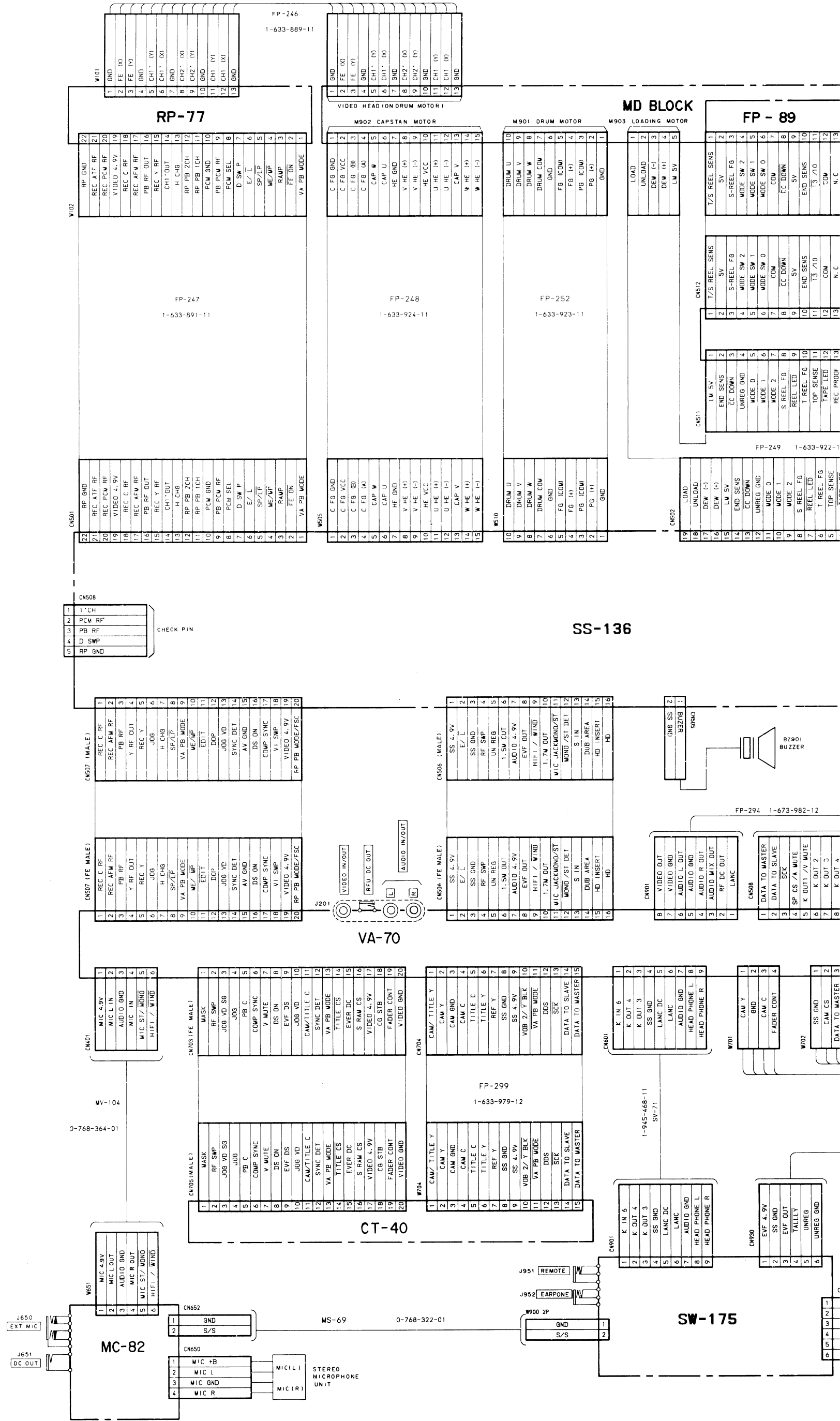


3-15. POWER BLOCK DIAGRAM

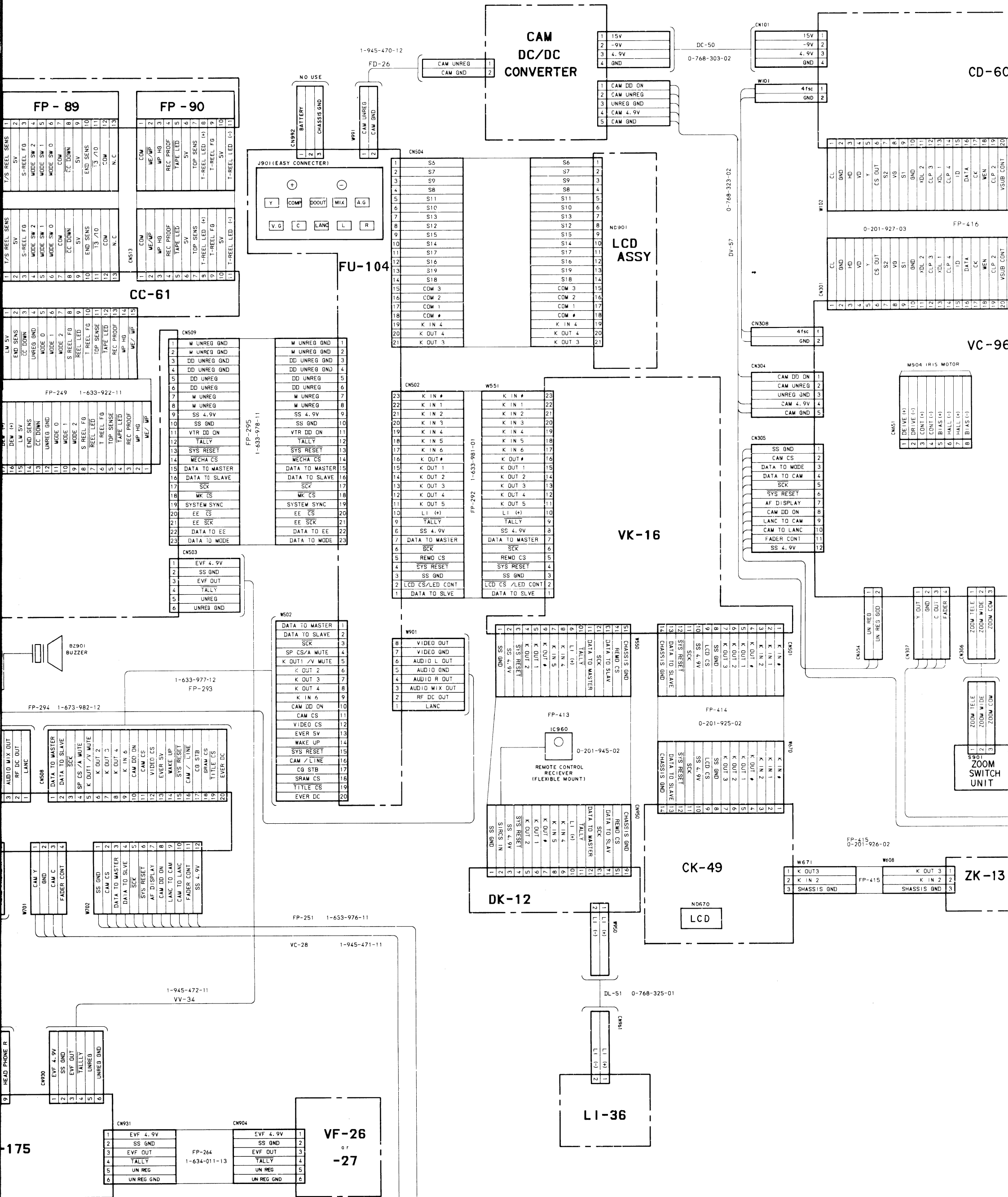


SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

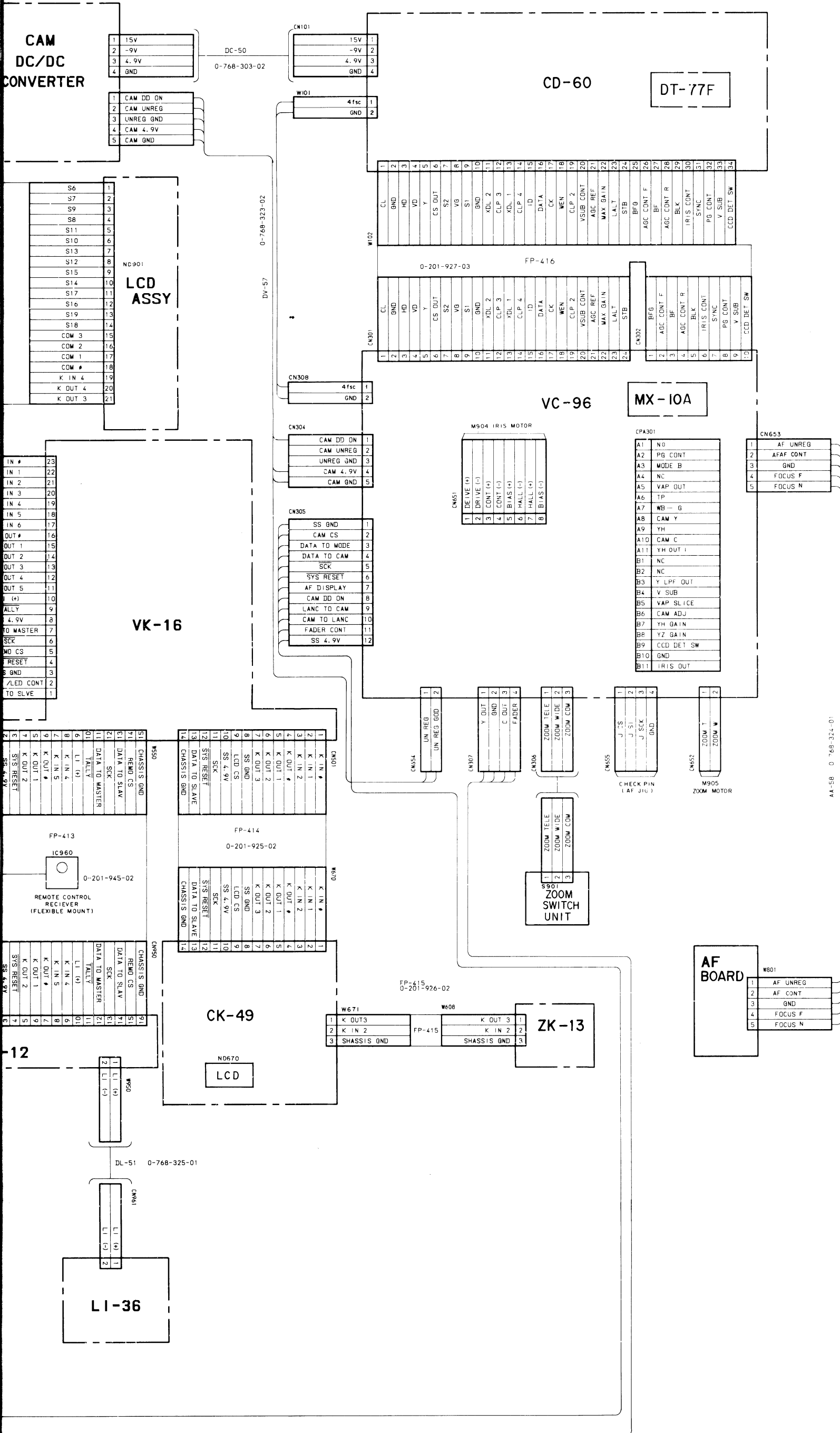
4-1. FRAME SCHEMATIC DIAGRAM



FRAME FRAME



16 17 18 19 20 21 22 23 24 25 26 27



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

• **For printed wiring boards.**

- ○ — : indicated a lead wire mounted on the component side.
- — : indicated a lead wire mounted on the conductor side.
- ■ : Parts mounted on the conductor side.
- ■ : Pattern from the side which enables seeing.
- ■ : Pattern of the rear side.
- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- ● : Through hole.

Caution:

Pattern face side: Parts on the pattern face side seen from (Conductor Side) the pattern face are indicated.
Parts face side: Parts on the parts face side seen from the (Component side) the pattern face are indicated.

• **For schematic diagrams.**

- Caution when replacing chip parts.
New parts must be attached after removal of chip.
Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
Chip resistor are 1/10W unless otherwise noted.
kΩ : 1000Ω, MΩ : 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μ μF.
50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
-  : nonflammable resistor.
-  : fusible resistor.
-  : panel designation.
-  : internal component.
-  : adjustment for repair.
- — : B+ Line.
- - - - : B- Line.
-  : IN/OUT direction of (+, -) B LINE.
- Circled numbers refer to waveforms.

Note:

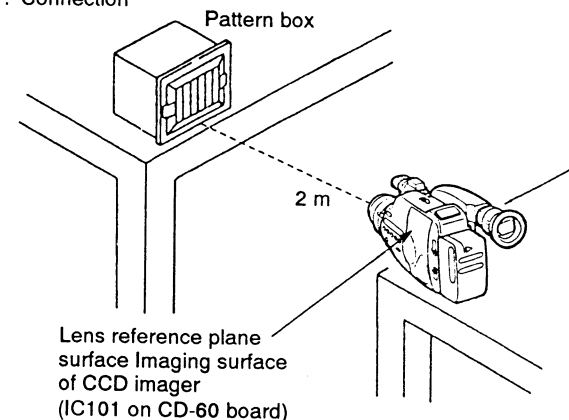
The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

• **Measuring conditions voltage value and waveform.**
(CAMERA, DIGITAL TITLE block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.
Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

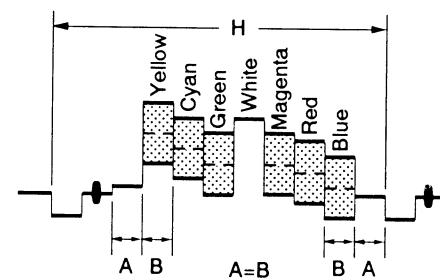


Fig. a (Video output terminal output waveform)

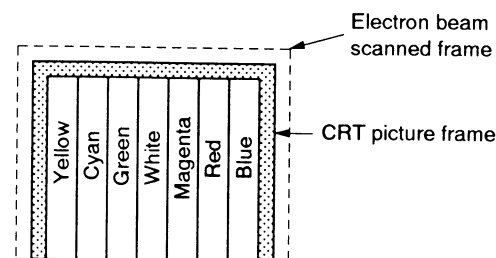


Fig. (Picture on monitor TV)

(VIDEO, SERVO/SYSTEM CONTROL, MODE CONTROL, VIEW FINDER block)

- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

There are not the external input terminal (VIDEO/AUDIO IN) and REC switch in AEP, UK model. Accordingly, perform as the followings for REC mode.

Signal input: Refer to the video signal input method for the model without the external input terminal described in VIDEO BLOCK ADJUSTMENTS (page 278, Fig. 10-1).

REC model: Refer to the transition method to REC mode for the model without the external input terminal in the same Fig. 10-2.

CC-60 (CCD IMAGER) PRINTED WIRING BOARD

— Ref. No. CD-60 BOARD: 6000 series —

* A-7062-777-A CD-60P BOARD, COMPLETE

(Ref. No 6,000 Series)

< DIODE >

D101	8-719-404-46	DIODE	MA110
D102	8-719-404-52	DIODE	MA143
D122	8-719-404-32	DIODE	MA141WA
D123	8-719-404-46	DIODE	MA110
D124	8-719-404-32	DIODE	MA141WA
D125	8-719-949-46	DIODE	1T32
D128	8-719-404-46	DIODE	MA110

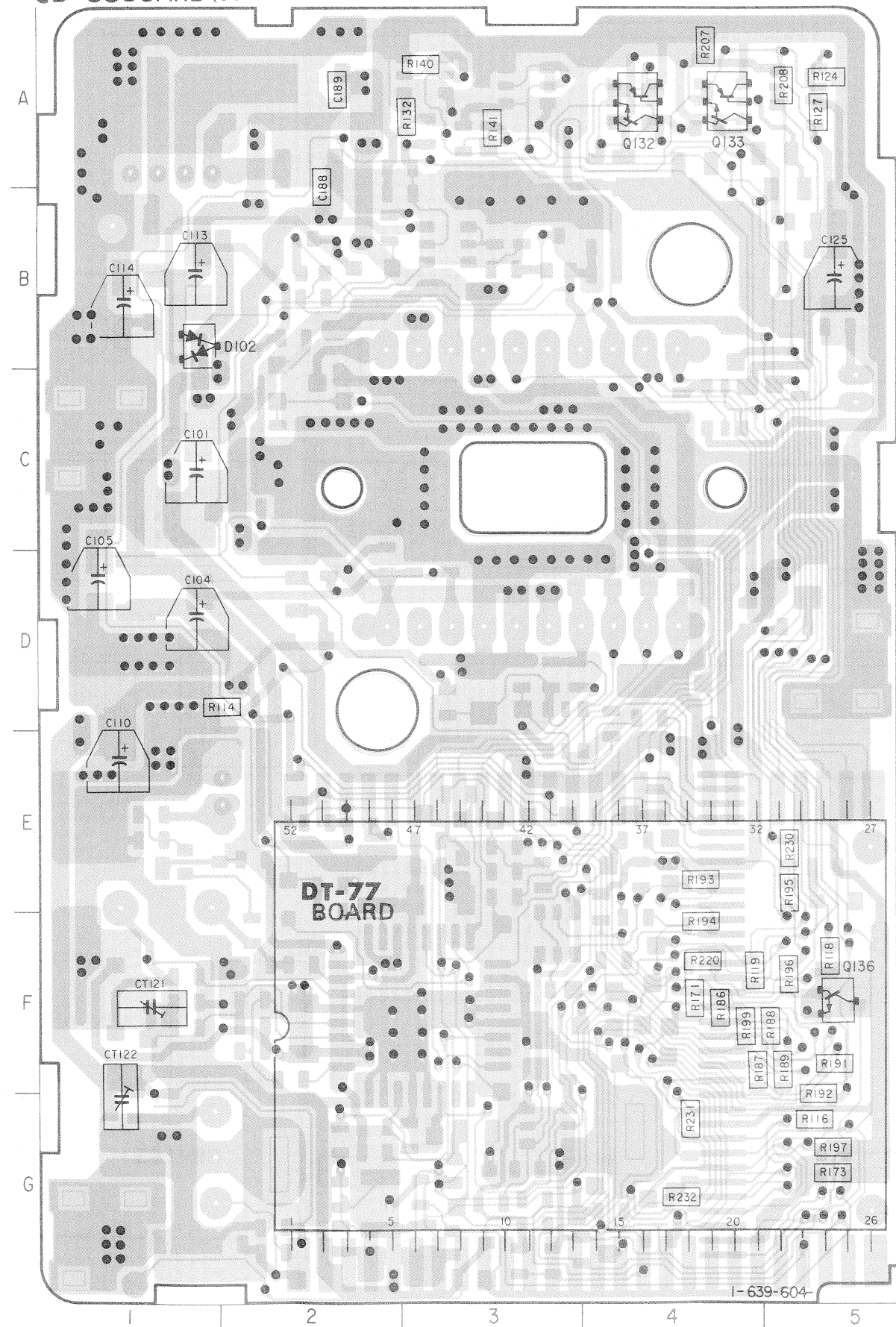
< IC >

IC121	8-752-326-08	IC	CXD1159Q
-------	--------------	----	----------

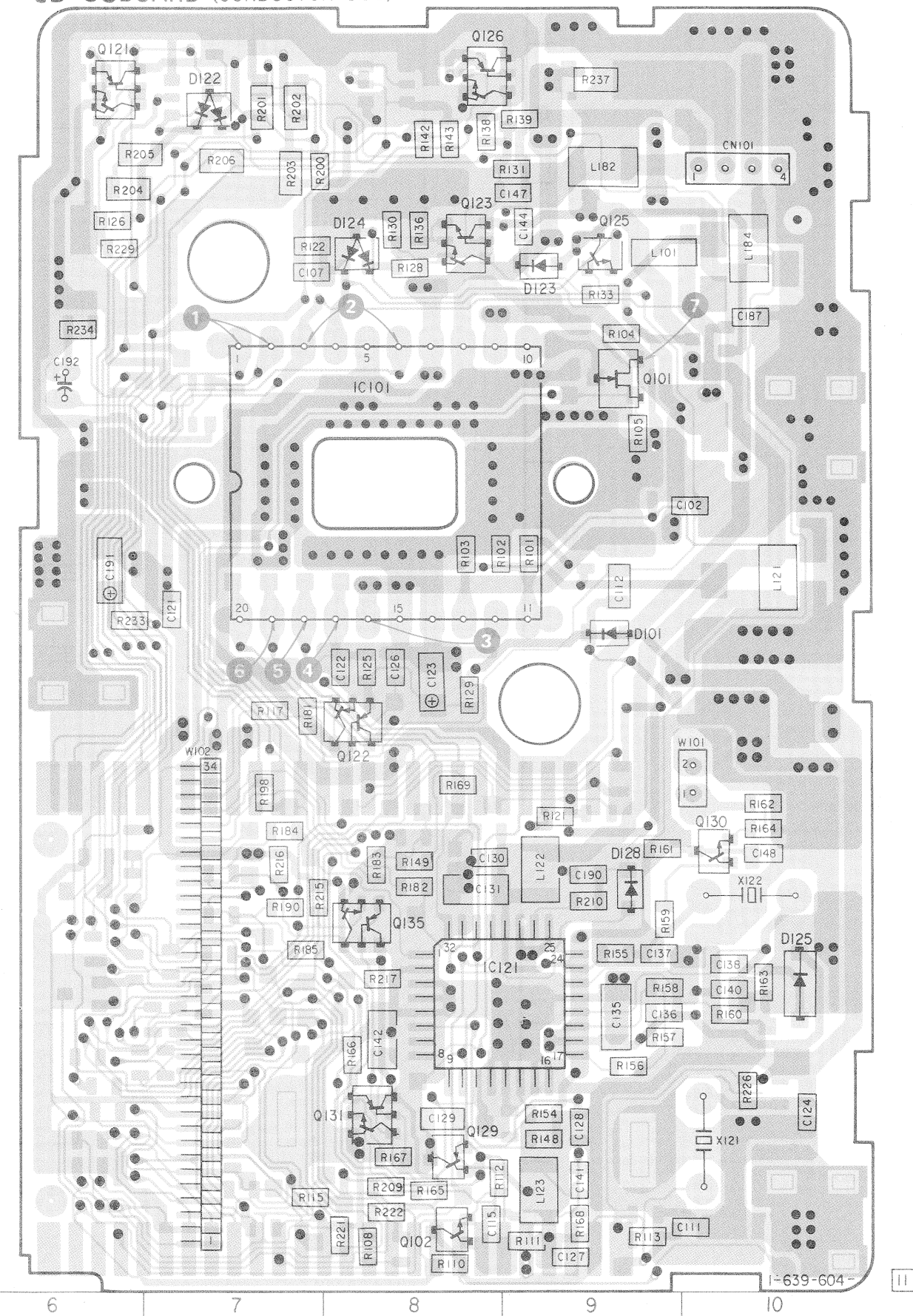
< TRANSISTOR >

Q101	8-765-420-02	TRANSISTOR	2SK300-3/4
Q102	8-729-905-35	TRANSISTOR	2SC4081
Q121	8-729-907-47	TRANSISTOR	1M21
Q122	8-729-402-78	TRANSISTOR	XN6401
Q123	8-729-402-19	TRANSISTOR	XN6501
Q125	8-729-905-35	TRANSISTOR	2SC4081
Q126	8-729-907-47	TRANSISTOR	1M21
Q129	8-729-905-23	TRANSISTOR	2SA1576
Q130	8-729-905-35	TRANSISTOR	2SC4081
Q131	8-729-907-47	TRANSISTOR	1M21
Q132	8-729-907-47	TRANSISTOR	1M21
Q133	8-729-907-47	TRANSISTOR	1M21
Q135	8-729-907-47	TRANSISTOR	1M21
Q136	8-729-402-45	TRANSISTOR	UN5212

CD-60BOARD (COMPONENT SIDE)



CD-60BOARD (CONDUCTOR SIDE)



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z

AA

AB

AC

AD

AE

AF

AG

AH

AI

AJ

AK

AL

AM

AN

AO

AP

AQ

AR

AS

AT

AU

AV

AW

AX

AY

AZ

BA

BB

BC

BD

BE

BF

BG

BH

BI

BJ

BK

BL

BM

BN

BO

BP

BQ

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BY

BZ

CA

CB

CC

CD

CE

CF

CG

CH

CI

CJ

CK

CL

CM

CN

CO

CP

CQ

CR

CS

CT

CU

CV

CW

CX

CY

CZ

DA

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DC

DD

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DG

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DJ

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FI

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FK

FL

FM

FN

FO

FP

FQ

FR

FS

FT

FU

FV

FW

FX

FY

FZ

GA

GB

GC

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GR

GS

GT

GU

GV

GW

GX

GY

GZ

HA

HB

HC

HD

HE

HF

HG

HH

HI

HJ

HK

HL

HM

HN

HO

HP

HQ

HR

HS

HT

HU

HV

HW

HX

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HZ

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JV

JW

JX

JY

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KA

KB

KC

KD

KE

KF

KG

KH

KI

KJ

KK

KL

KM

KN

KO

KP

KQ

KR

KS

KT

KU

KV

KW

KX

KY

KZ

LA

LB

LC

LD

LE

LF

LG

LH

LI

LJ

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LN

LO

LP

LQ

LR

LS

LT

LU

LV

LW

LX

LY

LZ

MA

MB

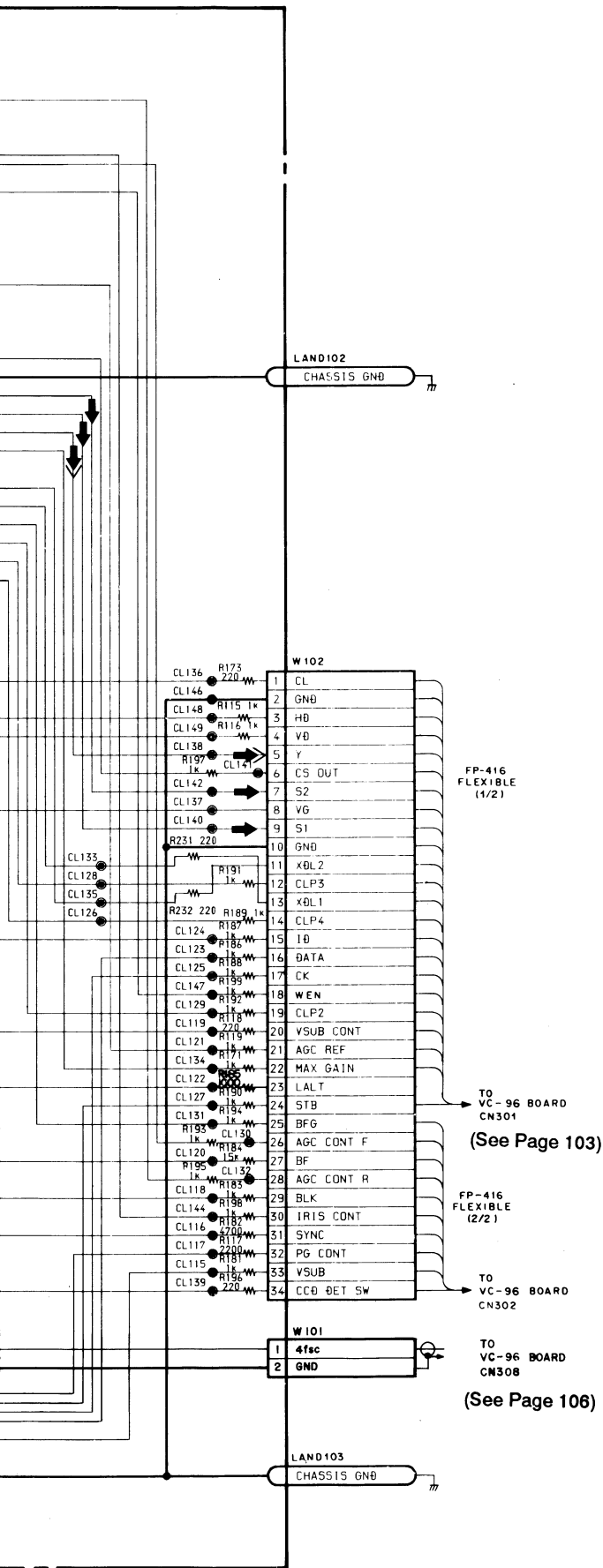
MC

MD

ME

<





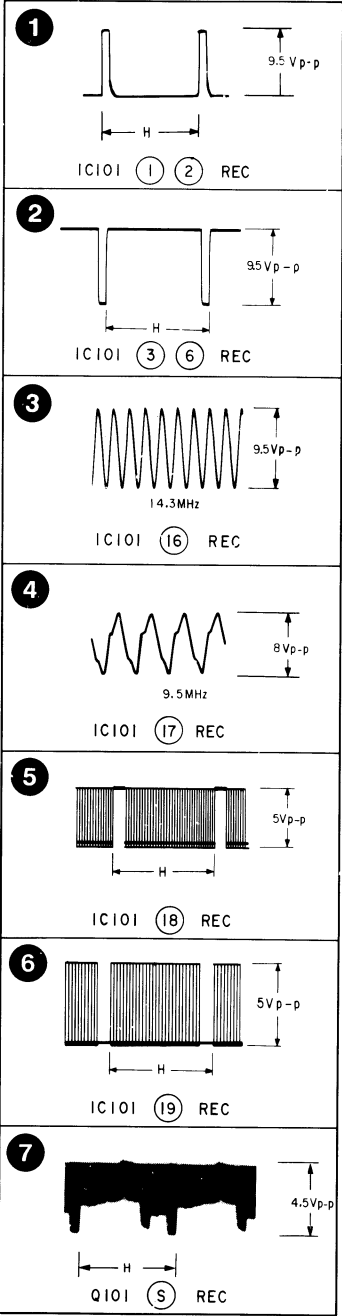
CAUTIONS FOR REPLACING THE CCD IMAGER

- According to type of CCD imager (IC101 on the CD-60 board), it is necessary to require the compensating ROM (IC001 on the DT-77F board).
The repairing CCD imager does not require the compensating ROM.
So when replacing the CCD imager on which the compensating ROM is installed, remove the compensating ROM before replacement.
- Since the mounted CD-60 and DT-77F boards which are supplied as a repair parts are not installed IC101 and IC001 respectively, replace the respective ICs from the previous board to the new when replacing each board.
- When you replaced the CCD imager, perform the overall camera head adjustment.
- CCD imager has such a structure that it may be spoiled by static electricity, so handle it with a care similar for MOS IC. Further, be sure that the light receiving part has no stick of dust and no entry of bright light.

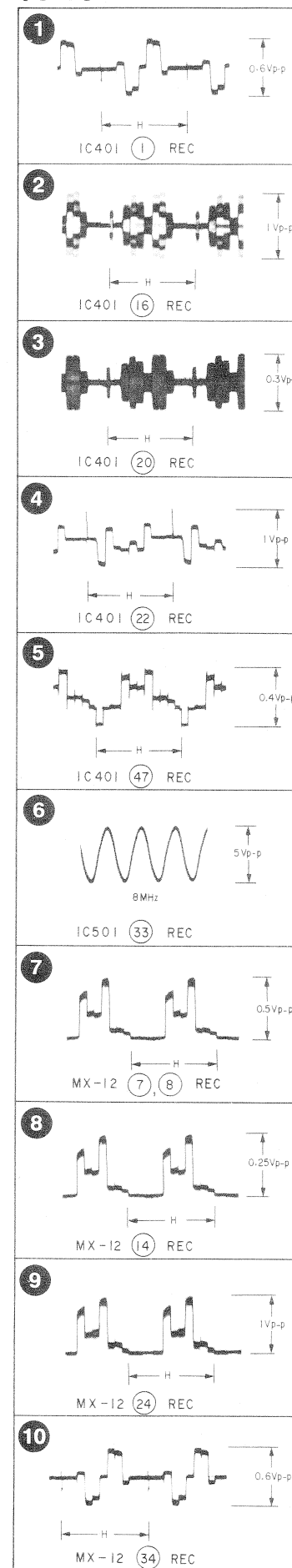
• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	➡➡	➡➡➡	
PB				

CD-60 BOARD



VC-96 BOARD (1/2)



VC-96 (CAMERA PROCESS) PRINTED WIRING BOARD

— Ref. No. VC-96 BOARD: 6000 series —

* A-7062-776-A VC-96P BOARD, COMPLETE

(Ref. No 6,000 Series)

< DIODE >

D501	8-719-404-46	DIODE	MA110
D502	8-719-404-46	DIODE	MA110
D503	8-719-404-46	DIODE	MA110
D504	8-719-404-46	DIODE	MA110
D651	8-719-976-90	DIODE	DTZ4.3A

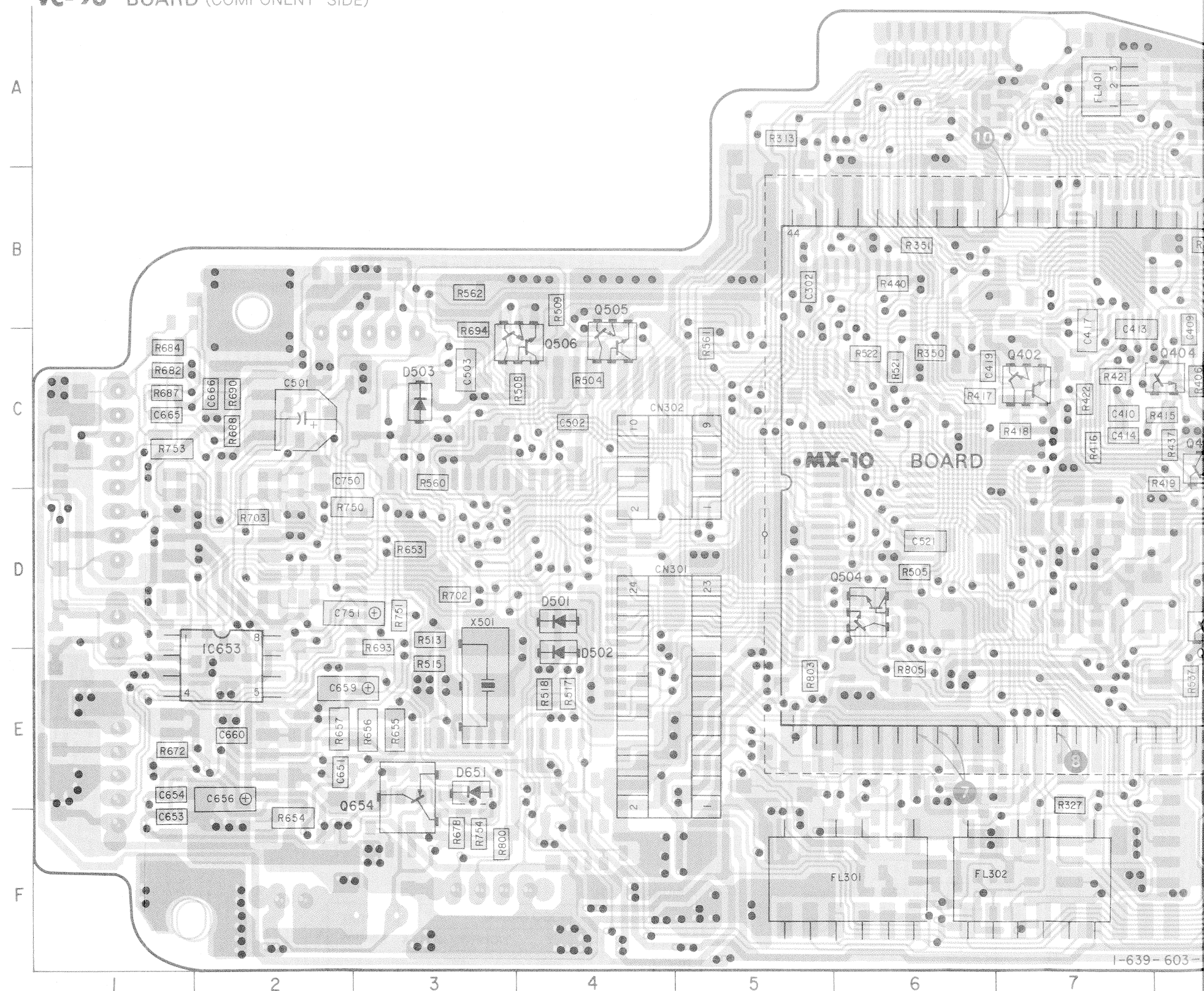
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IC301	8-759-635-27	IC	M62352GP
IC401	8-752-038-XX	IC	CXA1392R
IC501	8-759-038-85	IC	MC68HC11E9FU-SC400226
IC504	8-759-635-27	IC	M62352GP
IC508	8-759-937-56	IC	S-8054ALB-LM
IC509	8-759-509-05	IC	XRU4066BF
IC510	8-759-998-96	IC	LM324DR
IC651	8-759-981-82	IC	RC3414M
IC652	8-759-998-96	IC	LM324DR
IC653	8-759-500-11	IC	MM1036XFF
IC656	8-759-998-96	IC	LM324DR

< TRANSISTOR >

Q301	8-729-905-23	TRANSISTOR	2SA1576
Q302	8-729-905-23	TRANSISTOR	2SA1576
Q303	8-729-907-47	TRANSISTOR	1M21
Q401	8-729-907-47	TRANSISTOR	1M21
Q402	8-729-907-47	TRANSISTOR	1M21
Q403	8-729-905-23	TRANSISTOR	2SA1576
Q404	8-729-905-35	TRANSISTOR	2SC4081
Q504	8-729-925-39	TRANSISTOR	1M21
Q505	8-729-925-39	TRANSISTOR	1M21
Q506	8-729-925-77	TRANSISTOR	1M21
Q507	8-729-420-50	TRANSISTOR	UN5215
Q508	8-729-402-78	TRANSISTOR	XN6401
Q509	8-729-925-39	TRANSISTOR	1M21
Q510	8-729-905-35	TRANSISTOR	2SC4081
Q513	8-729-907-47	TRANSISTOR	1M21
Q516	8-729-905-35	TRANSISTOR	2SC4081
Q652	8-729-402-42	TRANSISTOR	UN5213
Q653	8-729-905-23	TRANSISTOR	2SA1576
Q654	8-729-106-60	TRANSISTOR	2SB1115A
Q655	8-729-905-35	TRANSISTOR	2SC4081
Q656	8-729-821-88	TRANSISTOR	2SK1332-3

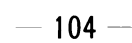
VC-96 BOARD (COMPONENT SIDE)

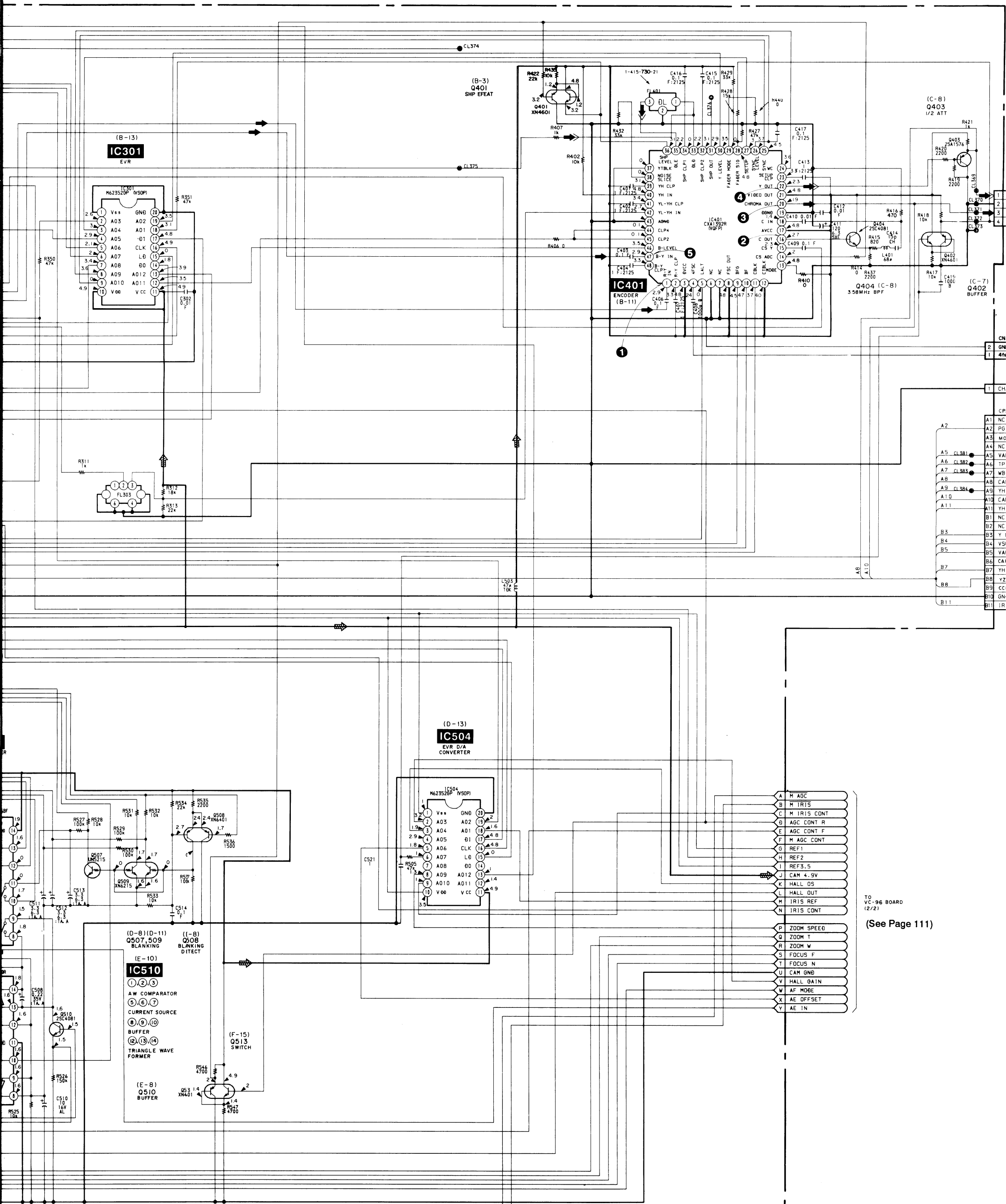




1	2	3	4	5	6	7	8	9	10	11
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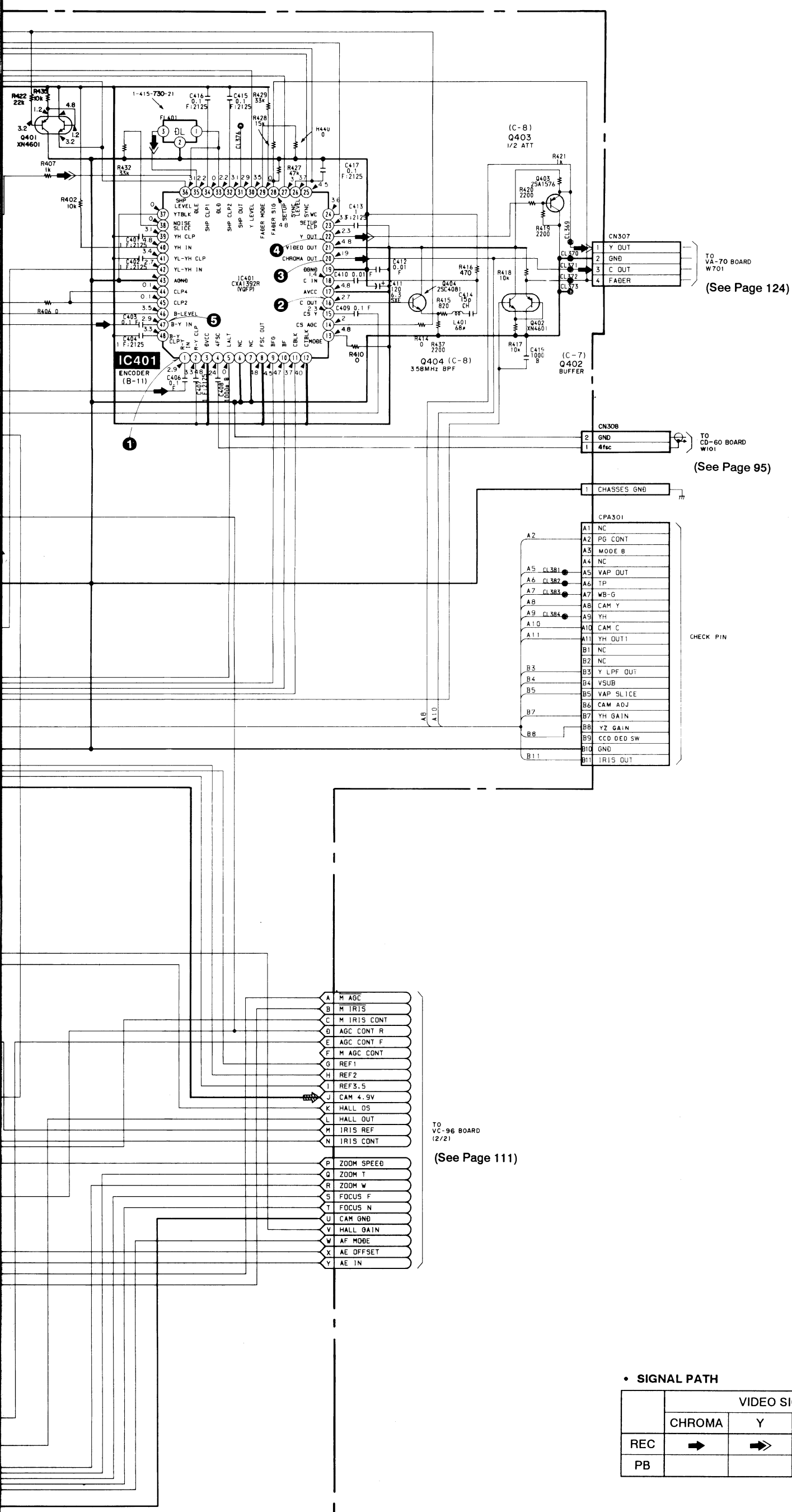
A
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G
H
I
J
K
L
M
N
O





no mark : CAMERA REC mode

VC-96 BOARD (1/2)



(See Page 124)

(See Page 95)

CHECK PIN

TO VC-96 BOARD (2/2)
(See Page 111)

• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	➡➡		
PB				

VC-96, AF (CAMERA LENS DRIVE) PRINTED WIRING BOARDS

— Ref. No. VC-96 (2/2) BOARD: 6000 series —

AF board is replaced as a block, so that the PRINTED WIRING BOARD of it is omitted.

* A-7062-776-A VC-96P BOARD, COMPLETE

(Ref. No 6,000 Series)

< DIODE >

D501	8-719-404-46	DIODE	MA110
D502	8-719-404-46	DIODE	MA110
D503	8-719-404-46	DIODE	MA110
D504	8-719-404-46	DIODE	MA110
D651	8-719-976-90	DIODE	DTZ4.3A

< IC >

IC301	8-759-635-27	IC	M62352GP
IC401	8-752-038-XX	IC	CXA1392R
IC501	8-759-038-85	IC	MC68HC11E9FU-SC400226
IC504	8-759-635-27	IC	M62352GP
IC508	8-759-937-56	IC	S-8054ALB-LM
IC509	8-759-509-05	IC	XRU4066BF
IC510	8-759-998-96	IC	LM324DR
IC651	8-759-981-82	IC	RC3414M
IC652	8-759-998-96	IC	LM324DR
IC653	8-759-500-11	IC	MM1036XFF
IC656	8-759-998-96	IC	LM324DR

< TRANSISTOR >

Q301	8-729-905-23	TRANSISTOR	2SA1576
Q302	8-729-905-23	TRANSISTOR	2SA1576
Q303	8-729-907-47	TRANSISTOR	IMZ1
Q401	8-729-907-47	TRANSISTOR	IMZ1
Q402	8-729-907-47	TRANSISTOR	IMZ1
Q403	8-729-905-23	TRANSISTOR	2SA1576
Q404	8-729-905-35	TRANSISTOR	2SC4081
Q504	8-729-925-39	TRANSISTOR	IMH8
Q505	8-729-925-39	TRANSISTOR	IMH8
Q506	8-729-925-77	TRANSISTOR	IMH6
Q507	8-729-420-50	TRANSISTOR	UN5215
Q508	8-729-402-78	TRANSISTOR	XN6401
Q509	8-729-925-39	TRANSISTOR	IMH8
Q510	8-729-905-35	TRANSISTOR	2SC4081
Q513	8-729-907-47	TRANSISTOR	IMZ1
Q516	8-729-905-35	TRANSISTOR	2SC4081
Q652	8-729-402-42	TRANSISTOR	UN5213
Q653	8-729-905-23	TRANSISTOR	2SA1576
Q654	8-729-106-60	TRANSISTOR	2SB1115A
Q655	8-729-905-35	TRANSISTOR	2SC4081

Q656	8-729-821-88	TRANSISTOR	2SK1332-3
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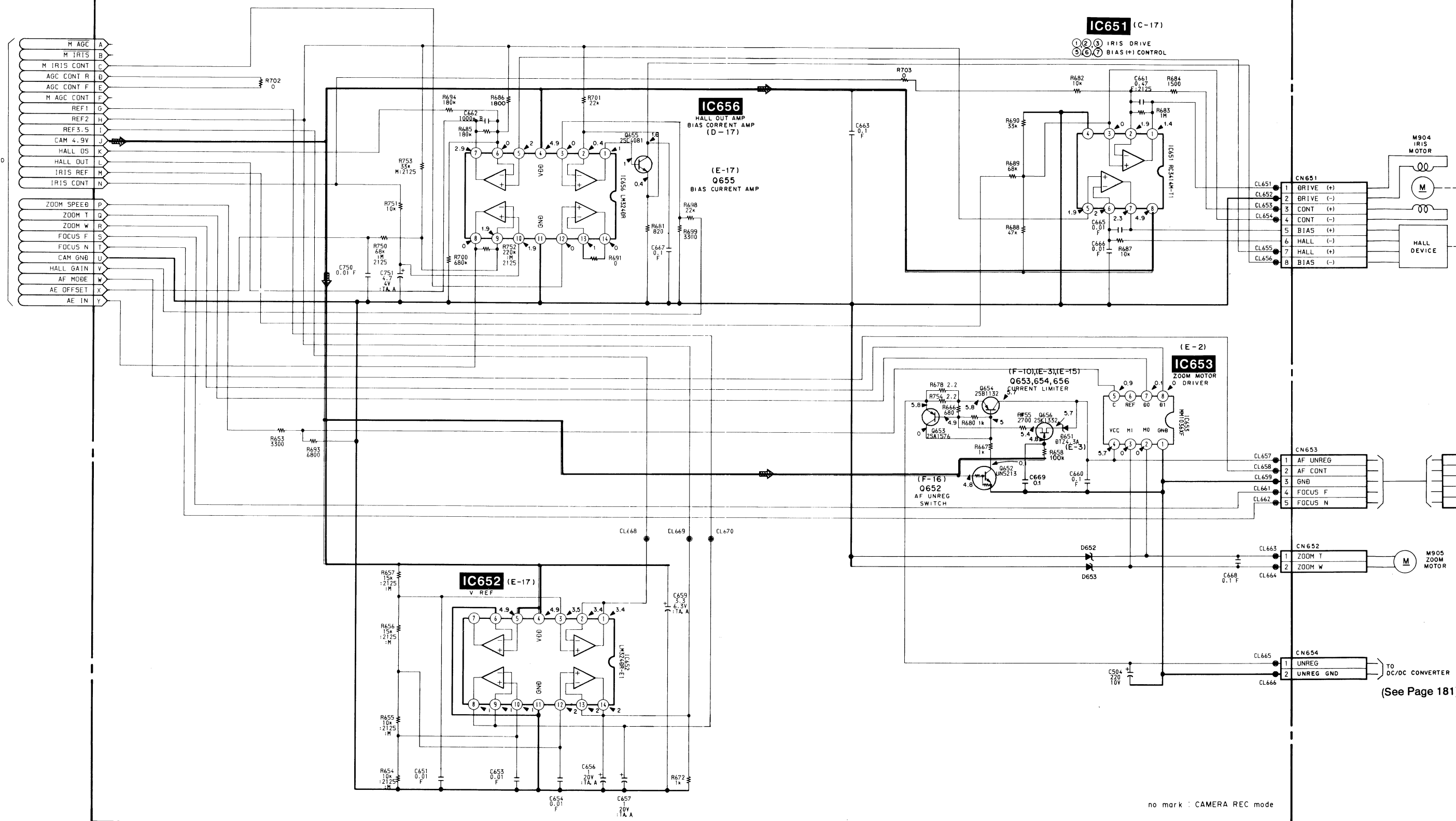
VC-96 BOARD (COMPONENT SIDE)



VC-96 (2/2), AF (CAMERA LENS DRIVE) SCHEMATIC DIAGRAMS

— Ref. No. VC-96 (2/2) BOARD: 6000 series —

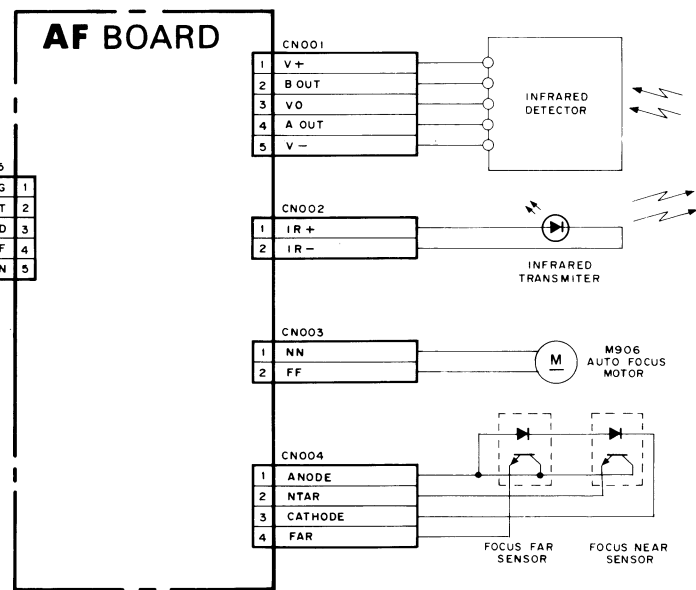
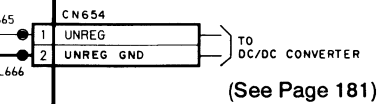
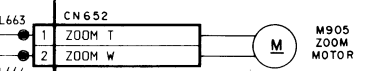
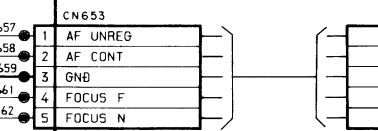
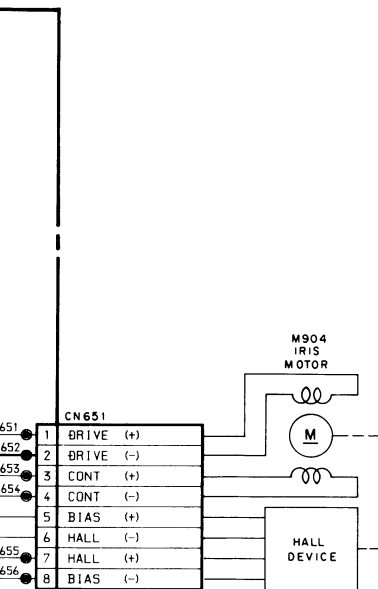
VC-96 BOARD (2/2)

TG
VC-96 BOARD
(1/2)
(See Page 105)

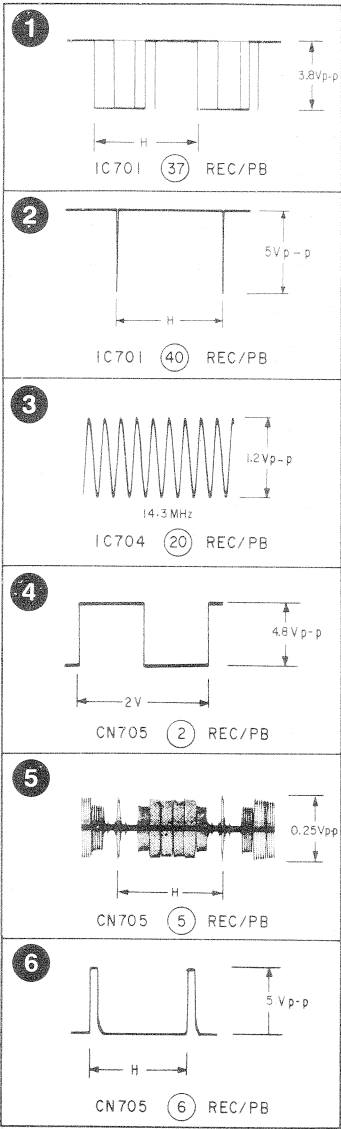
no mark : CAMERA REC mode

(See Page 181)

15	16	17	18	19	20	21	22
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CT-40 BOARD



* A-7062-779-A CT-40P BOARD, COMPLETE

(Ref. No 1,000 Series)

< DIODE >

D901	8-719-949-46	DIODE	1T32
D903	8-719-404-46	DIODE	MA110
D904	8-719-404-46	DIODE	MA110
D905	8-719-404-46	DIODE	MA110
D906	8-719-404-46	DIODE	MA110

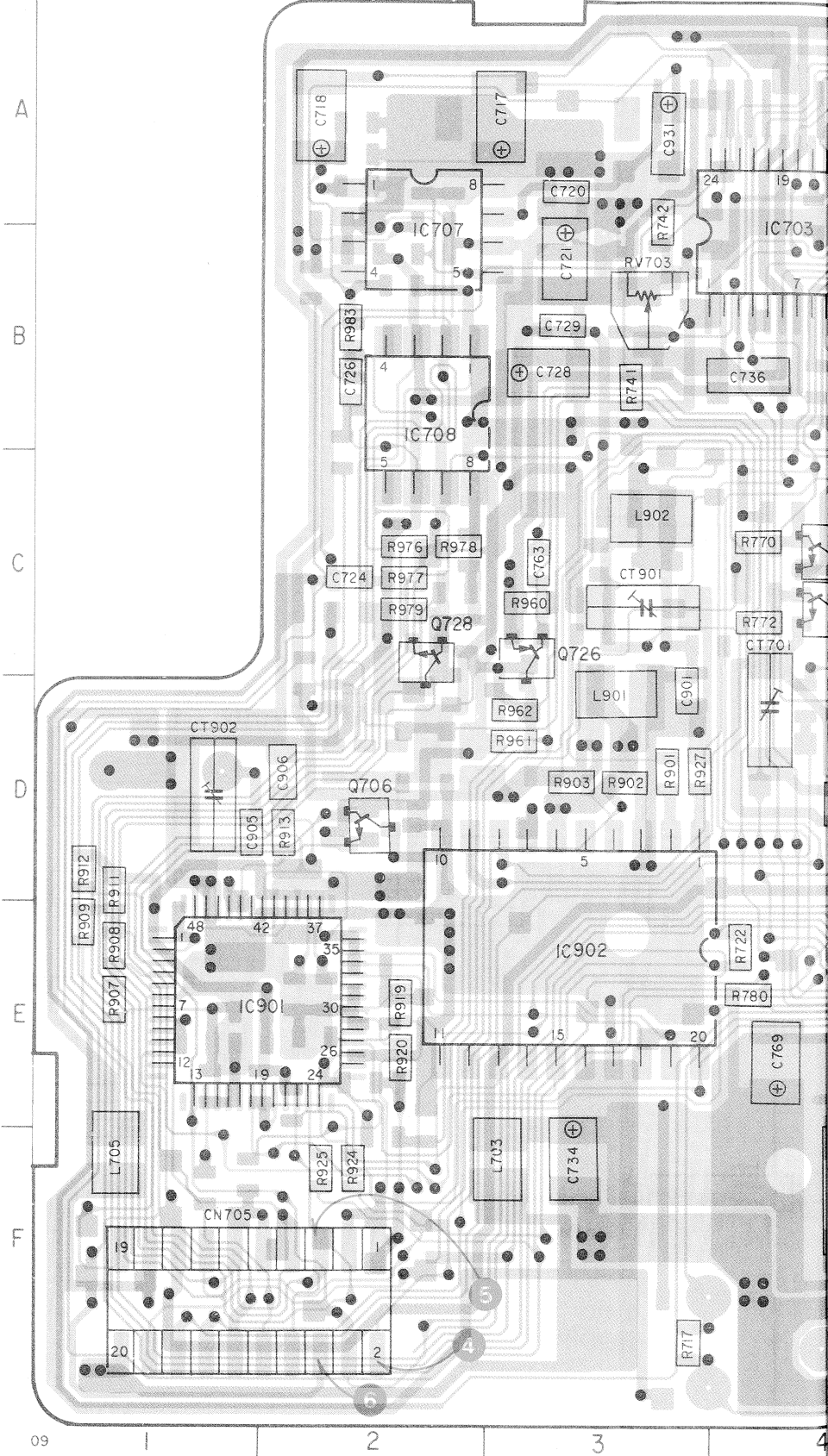
< IC >

IC701	8-759-998-30	IC	CF79028PG
IC702	8-759-515-28	IC	MS6264CLL-15FC
IC703	8-752-039-49	IC	CXA1393AN
IC704	8-759-634-47	IC	M51285BGP
IC707	8-759-710-29	IC	NJM2235M
IC708	8-759-710-09	IC	NJM2233AM
IC709	8-759-710-09	IC	NJM2233AM
IC713	8-759-234-20	IC	TC7S08F
IC901	8-759-970-80	IC	MB673198U
IC902	8-759-153-41	IC	uPD6451AGT-611

< TRANSISTOR >

Q701	8-729-925-91	TRANSISTOR	DTC115EU
Q702	8-729-907-03	TRANSISTOR	FMG5
Q703	8-729-905-18	TRANSISTOR	DTC144EU
Q704	8-729-905-35	TRANSISTOR	2SC4081
Q705	8-729-905-24	TRANSISTOR	2SA1576
Q706	8-729-905-18	TRANSISTOR	DTC144EU
Q707	8-729-905-35	TRANSISTOR	2SC4081
Q708	8-729-905-15	TRANSISTOR	DTC144WU
Q709	8-729-905-35	TRANSISTOR	2SC4081
Q710	8-729-905-35	TRANSISTOR	2SC4081
Q720	8-729-905-18	TRANSISTOR	DTC144EU
Q726	8-729-905-23	TRANSISTOR	2SA1576
Q727	8-729-905-35	TRANSISTOR	2SC4081
Q728	8-729-905-35	TRANSISTOR	2SC4081
Q729	8-729-905-18	TRANSISTOR	DTC144EU
Q730	8-729-905-12	TRANSISTOR	DTA144EU
Q800	8-729-905-18	TRANSISTOR	DTC144EU
Q801	8-729-905-23	TRANSISTOR	2SA1576

CT-40 BOARD (COMPONENT SIDE)





TITLE	TITLE
1. <u>THE</u>	1. <u>THE</u>
2. <u>THE</u>	2. <u>THE</u>
3. <u>THE</u>	3. <u>THE</u>
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73. <u>THE</u>	73. <u>THE</u>
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76. <u>THE</u>	76. <u>THE</u>
77. <u>THE</u>	77. <u>THE</u>
78. <u>THE</u>	78. <u>THE</u>
79. <u>THE</u>	79. <u>THE</u>
80. <u>THE</u>	80. <u>THE</u>
81. <u>THE</u>	81. <u>THE</u>
82. <u>THE</u>	82. <u>THE</u>
83. <u>THE</u>	83. <u>THE</u>
84. <u>THE</u>	84. <u>THE</u>
85. <u>THE</u>	85. <u>THE</u>
86. <u>THE</u>	86. <u>THE</u>
87. <u>THE</u>	87. <u>THE</u>
88. <u>THE</u>	88. <u>THE</u>
89. <u>THE</u>	89. <u>THE</u>
90. <u>THE</u>	90. <u>THE</u>
91. <u>THE</u>	91. <u>THE</u>
92. <u>THE</u>	92. <u>THE</u>
93. <u>THE</u>	93. <u>THE</u>
94. <u>THE</u>	94. <u>THE</u>
95. <u>THE</u>	95. <u>THE</u>
96. <u>THE</u>	96. <u>THE</u>
97. <u>THE</u>	97. <u>THE</u>
98. <u>THE</u>	98. <u>THE</u>
99. <u>THE</u>	99. <u>THE</u>
100. <u>THE</u>	100. <u>THE</u>

CT-40 (TITLER PROCESS) SCHEMATIC DIAGRAM

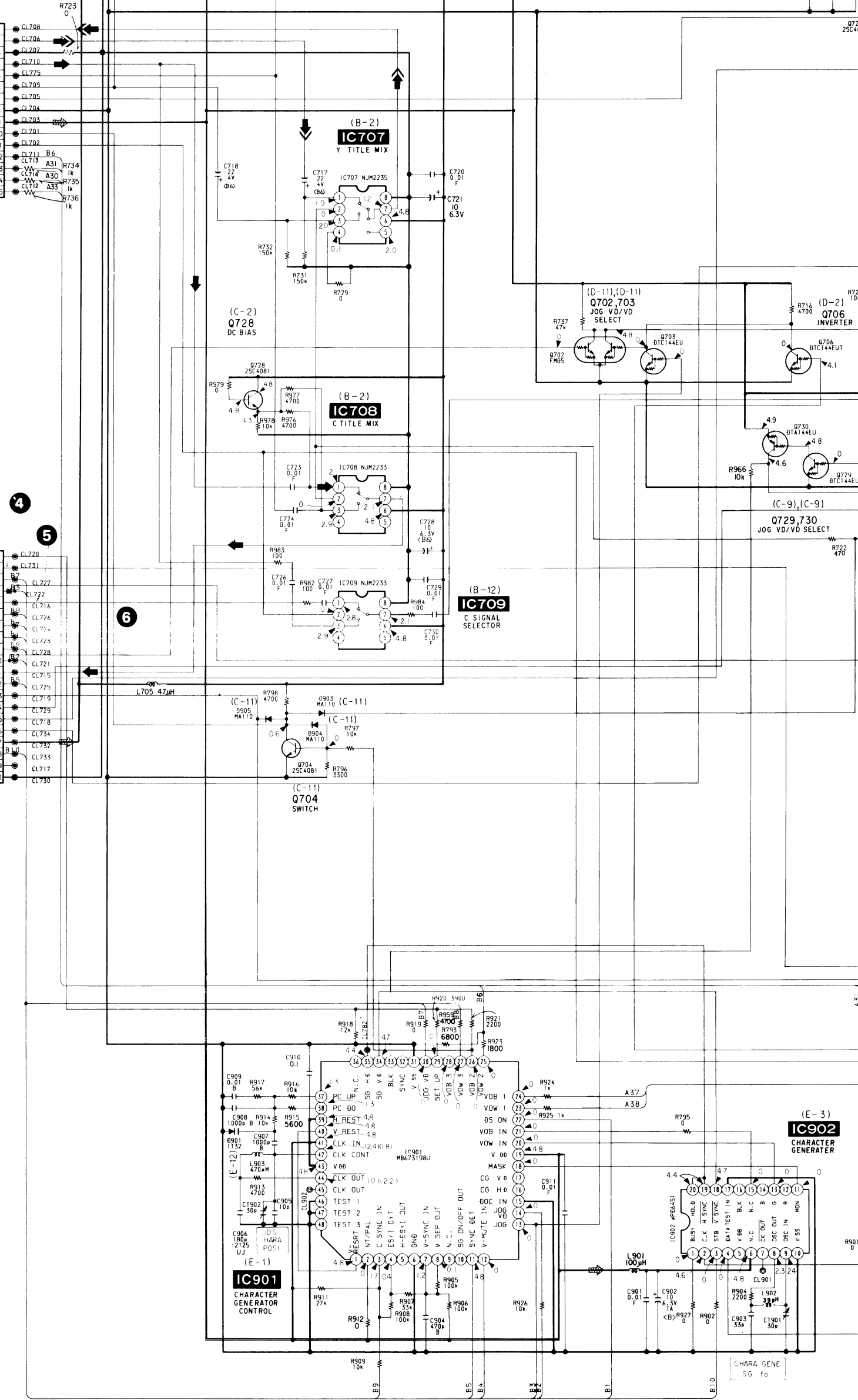
— Ref. No. CT-40 BORRD: 1000 series —

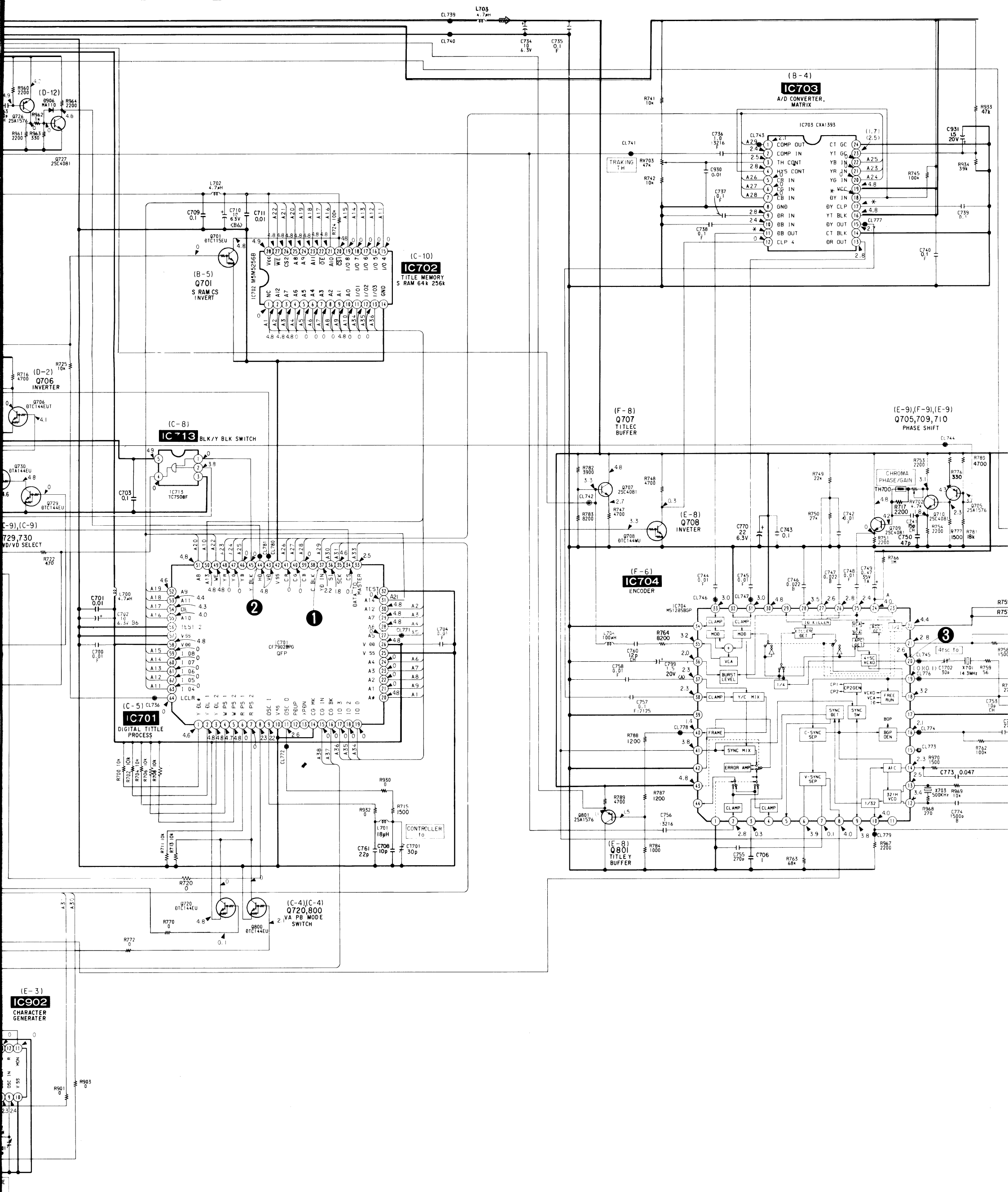
W704
FP-299
FLEXIBLE
TO
VA-70 BOARD
CN704
(See Page 124)

CN705 (FEMALE)
TO
VA-70 BOARD
CN705 (MALE)
(See Page 124)

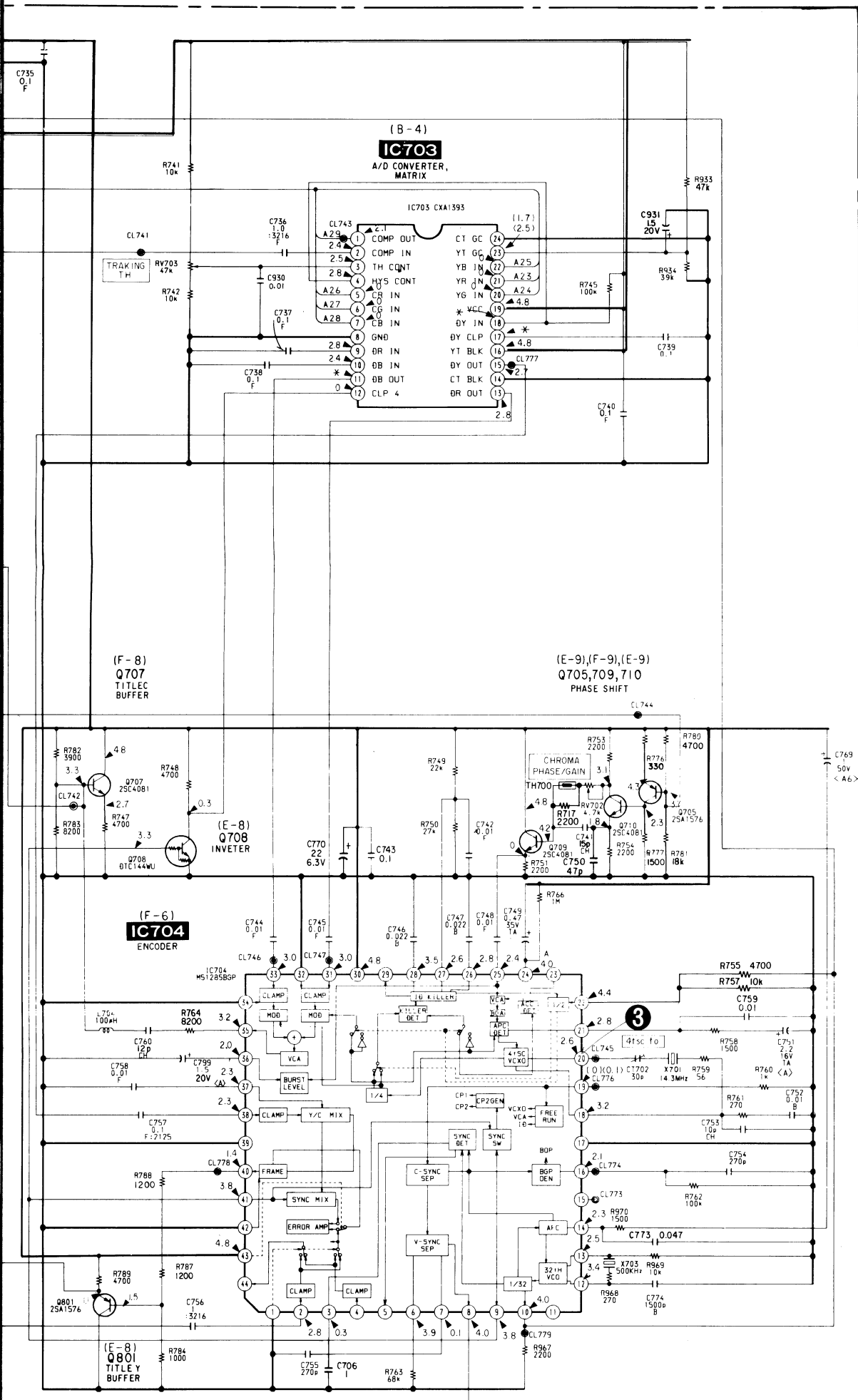
CAM/TITLE Y	1	CL708
CAM Y	2	CL708
CAM GND	3	CL707
CAM C	4	CL710
TITLE C	5	CL775
TITLE Y	6	CL709
REF Y	7	CL705
SS GND	8	CL704
SS 4.9V	9	CL703
VOB2/Y BLK	10	CL701
VA PB MOBE	11	CL702
DBS	12	CL711 B6
SCK	13	CL714 A31
DATA TO SLAVE	14	CL712 A30
DATA TO MASTER	15	CL712 A33

MASK	1	CL728
HF SWP	2	CL731
JOG VD SG	3	CL727
JOG	4	CL732
PB C	5	CL716
COMP SYNC	6	CL726
V MUTF	7	CL725
DS ON	8	CL723
EVF DS	9	CL728
JOG VD	10	CL721
CAM/TITLE C	11	CL715
SYNC BET	12	CL725
VA PB MOBE	13	CL719
TITLE CS	14	CL729
EVER OC	15	CL718
S RAM CS	16	CL734
VIDEO 4.9V	17	CL732
CG STB	18	CL733
FADER CONT	19	CL717
VIDEO GND	20	CL730





17 18 19 20 21 22 23 24 25 26 27

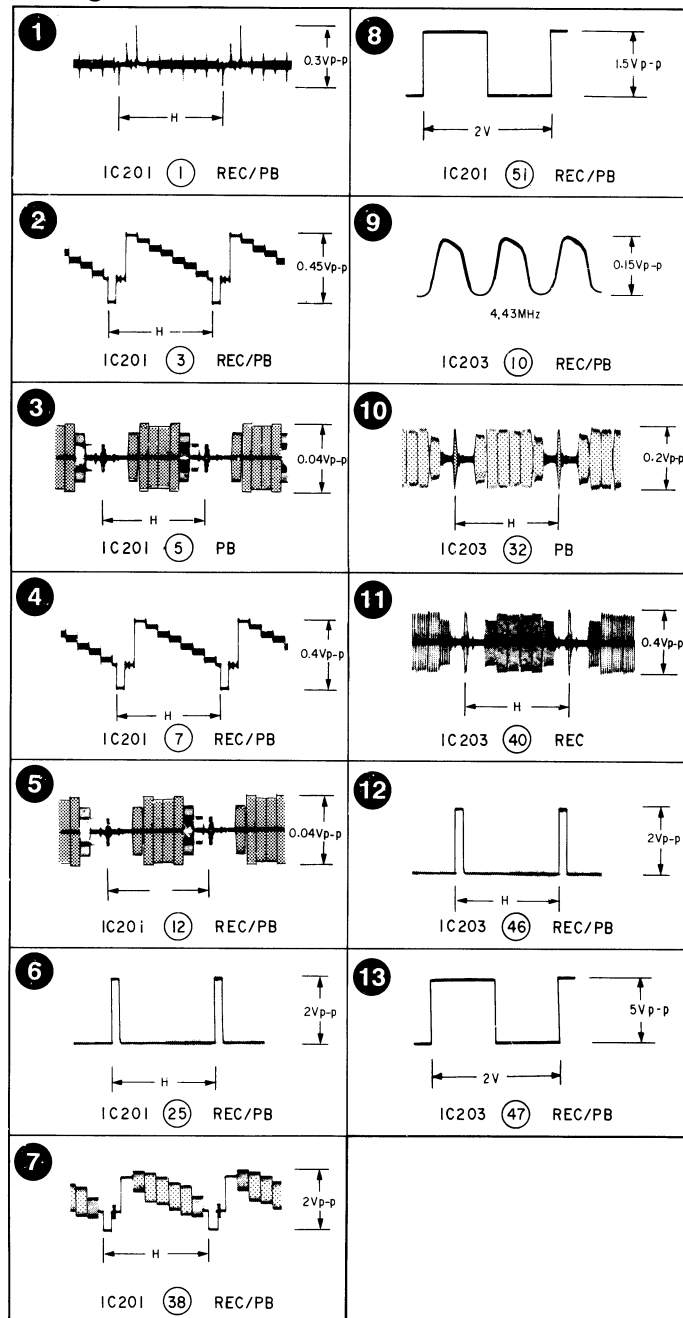


• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➔	➔➔		
PB				

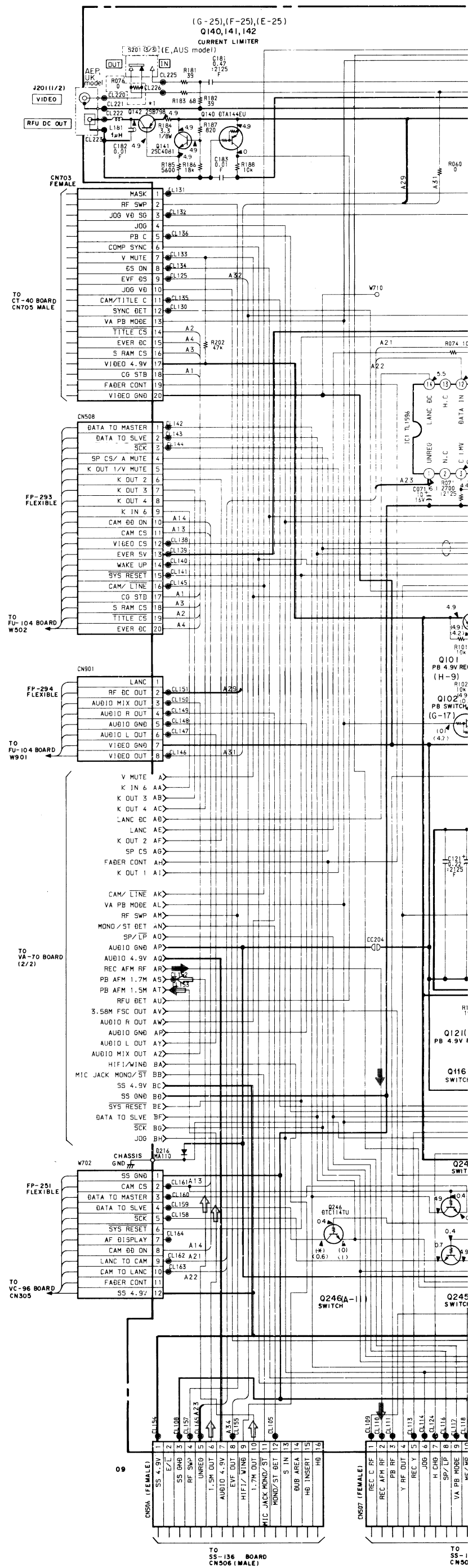
VA-70 (1/2) (VIDEO PROCESS) SCHEMATIC DIAGRAM

— Ref. No. VA-70 (1/2) BOARD: 1000 series —

VA-70 BOARD (1/2)

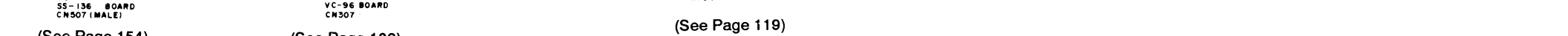
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC	➡	➡➡	➡➡➡	➡
PB	➡	➡➡	➡➡➡	➡



(See Page 154)

(See F





— Ref. No. VA-70 BOARD: 1000 series —

* A-7062-780-A VA-70P BOARD, COMPLETE (AEP/UK)

* A-7062-851-A VA-70PB BOARD, COMPLETE (AUS/E)

(Ref. No 1,000 Series)

< DIODE >

< DIODE >				< TRANSISTOR >					
				Q105	8-729-905-35 TRANSISTOR	2SC4081	Q241	8-729-905-23 TRANSISTOR	2SA1576
				Q106	8-729-102-07 TRANSISTOR	2SC2223	Q244	8-729-905-18 TRANSISTOR	DTC144EU
D101	8-719-800-76 DIODE	1SS226		Q107	8-729-905-12 TRANSISTOR	DTA144EU	Q245	8-729-905-XX TRANSISTOR	DTC114TU
D202	8-719-941-86 DIODE	DAN202U		Q109	8-729-905-35 TRANSISTOR	2SC4081	Q246	8-729-905-XX TRANSISTOR	DTC114TU
D203	8-719-941-86 DIODE	DAN202U		Q115	8-729-905-35 TRANSISTOR	2SC4081	Q247	8-729-905-XX TRANSISTOR	DTC114TU
D204	8-719-404-46 DIODE	MA110							
D205	8-719-941-86 DIODE	DAN202U		Q116	8-729-905-18 TRANSISTOR	DTC144EU	Q248	8-729-905-18 TRANSISTOR	DTC144EU
				Q117	8-729-905-35 TRANSISTOR	2SC4081	Q250	8-729-905-35 TRANSISTOR	2SC4081
D207	8-719-941-86 DIODE	DAN202U		Q118	8-729-905-23 TRANSISTOR	2SA1576	Q251	8-729-905-18 TRANSISTOR	DTC144EU
D208	8-719-941-86 DIODE	DAN202U		Q119	8-729-905-35 TRANSISTOR	2SC4081	Q252	8-729-905-18 TRANSISTOR	DTC144EU
D209	8-719-941-86 DIODE	DAN202U		Q121	8-729-141-48 TRANSISTOR	2SB624T1-BV345	Q254	8-729-905-35 TRANSISTOR	2SC4081
D210	8-719-404-46 DIODE	MA110							
D214	8-719-940-45 DIODE	MA159		Q122	8-729-102-07 TRANSISTOR	2SC2223	Q301	8-729-905-23 TRANSISTOR	2SA1576
				Q123	8-729-905-35 TRANSISTOR	2SC4081	Q303	8-729-905-35 TRANSISTOR	2SC4081
D215	8-719-404-46 DIODE	MA110		Q130	8-729-905-35 TRANSISTOR	2SC4081	Q304	8-729-905-35 TRANSISTOR	2SC4081
D216	8-719-404-46 DIODE	MA110		Q131	8-729-905-23 TRANSISTOR	2SA1576	Q306	8-729-905-35 TRANSISTOR	2SC4081
D217	8-719-800-76 DIODE	1SS226		Q140	8-729-905-12 TRANSISTOR	DTA144EU	Q307	8-729-905-18 TRANSISTOR	DTC144EU
D219	8-719-941-86 DIODE	DAN202U							
D351	8-719-404-46 DIODE	MA110		Q141	8-729-905-35 TRANSISTOR	2SC4081	Q310	8-729-905-35 TRANSISTOR	2SC4081
				Q142	8-729-101-07 TRANSISTOR	2SB798-DLDK	Q311	8-729-905-35 TRANSISTOR	2SC4081
D400	8-719-941-86 DIODE	DAN202U		Q154	8-729-905-35 TRANSISTOR	2SC4081	Q351	8-729-905-35 TRANSISTOR	2SC4081
D401	8-719-941-86 DIODE	DAN202U		Q171	8-729-905-35 TRANSISTOR	2SC4081	Q352	8-729-905-35 TRANSISTOR	2SC4081
D402	8-719-404-46 DIODE	MA110		Q172	8-729-905-35 TRANSISTOR	2SC4081	Q353	8-729-905-35 TRANSISTOR	2SC4081

< IC >

		< IC >											
				Q192	8-729-905-18 TRANSISTOR	DTC144EU	Q356	8-729-905-18 TRANSISTOR	DTC144EU				
				Q195	8-729-905-12 TRANSISTOR	DTA144EU	Q357	8-729-905-12 TRANSISTOR	DTA144EU				
IC001	8-759-999-02 IC	TL1596CDSB		Q196	8-729-905-18 TRANSISTOR	DTC144EU	Q358	8-729-905-18 TRANSISTOR	DTC144EU				
IC101	8-759-012-00 IC	MC10H116M		Q201	8-729-905-35 TRANSISTOR	2SC4081	Q359	8-729-102-08 TRANSISTOR	2SC2223-F14				
IC201	8-752-036-19 IC	CXA1207R											
IC202	8-752-333-24 IC	CXL1506M		Q202	8-729-905-12 TRANSISTOR	DTA144EU	Q360	8-729-905-18 TRANSISTOR	DTC144EU				
IC203	8-752-036-20 IC	CXA1208R		Q203	8-729-905-23 TRANSISTOR	2SA1576	Q362	8-729-905-18 TRANSISTOR	DTC144EU				
				Q204	8-729-905-35 TRANSISTOR	2SC4081	Q400	8-729-905-18 TRANSISTOR	DTC144EU				
IC204	8-759-605-61 IC	CXA1203N		Q205	8-729-905-18 TRANSISTOR	DTC144EU	Q401	8-729-905-18 TRANSISTOR	DTC144EU				
IC205	8-759-710-29 IC	NJM2235M		Q206	8-729-905-35 TRANSISTOR	2SC4081	Q402	8-729-905-35 TRANSISTOR	2SC4081				
IC206	8-759-320-76 IC	HA118070FPTR											
IC207	8-759-711-71 IC	NJM2234M		Q209	8-729-905-18 TRANSISTOR	DTC144EU	Q403	8-729-904-07 TRANSISTOR	FMG2				
IC400	8-759-823-19 IC	CXA-1488R		Q210	8-729-905-23 TRANSISTOR	2SA1576	Q404	8-729-904-07 TRANSISTOR	FMG2				
				Q211	8-729-905-35 TRANSISTOR	2SC4081	Q405	8-729-905-18 TRANSISTOR	DTC144EU				
IC401	8-759-823-19 IC	CXA-1536Q		Q212	8-729-905-35 TRANSISTOR	2SC4081	Q406	8-729-905-18 TRANSISTOR	DTC144EU				
IC402	8-759-823-19 IC	CXA-1488R		Q215	8-729-905-23 TRANSISTOR	2SA1576	Q407	8-729-905-XX TRANSISTOR	DTC114TU				

< TRANSISTOR >

< TRANSISTOR >				< TRANSISTOR >			
Q001	8-729-905-23	TRANSISTOR	2SA1576	Q221	8-729-905-18	TRANSISTOR	DTC144EU
Q002	8-729-905-35	TRANSISTOR	2SC4081	Q222	8-729-905-12	TRANSISTOR	DTA144EU
Q004	8-729-905-35	TRANSISTOR	2SC4081	Q223	8-729-905-35	TRANSISTOR	2SC4081
Q005	8-729-905-35	TRANSISTOR	2SC4081	Q224	8-729-905-35	TRANSISTOR	2SC4081
Q060	8-729-905-18	TRANSISTOR	DTC144EU	Q225	8-729-905-12	TRANSISTOR	DTA144EU
				Q226	8-729-905-35	TRANSISTOR	2SC4081
				Q227	8-729-905-35	TRANSISTOR	2SC4081
Q061	8-729-905-18	TRANSISTOR	DTC144EU	Q228	8-729-905-23	TRANSISTOR	2SA1576
Q062	8-729-905-18	TRANSISTOR	DTC144EU				
Q063	8-729-905-12	TRANSISTOR	DTA144EU	Q229	8-729-905-35	TRANSISTOR	2SC4081
Q101	8-729-905-23	TRANSISTOR	2SA1576	Q231	8-729-905-35	TRANSISTOR	2SC4081
Q102	8-729-905-18	TRANSISTOR	DTC144EU	Q232	8-729-905-35	TRANSISTOR	2SC4081
				Q238	8-729-905-23	TRANSISTOR	2SA1576
				Q240	8-729-905-35	TRANSISTOR	2SC4081



* A-7062-780-A VA-70P BOARD, COMPLETE (AEP/UK)

* A-7062-851-A VA-70PB BOARD, COMPLETE (AUS/E)

(Ref. No. 1,000 Series)

< DIODE >

D101	8-719-800-76	DIODE	1SS226
D202	8-719-941-86	DIODE	DAN202U
D203	8-719-941-86	DIODE	DAN202U
D204	8-719-404-46	DIODE	MA110
D205	8-719-941-86	DIODE	DAN202U
D207	8-719-941-86	DIODE	DAN202U
D208	8-719-941-86	DIODE	DAN202U
D209	8-719-941-86	DIODE	DAN202U
D210	8-719-404-46	DIODE	MA110
D214	8-719-940-45	DIODE	MA159
D215	8-719-404-46	DIODE	MA110
D216	8-719-404-46	DIODE	MA110
D217	8-719-800-76	DIODE	1SS226
D219	8-719-941-86	DIODE	DAN202U
D351	8-719-404-46	DIODE	MA110
D400	8-719-941-86	DIODE	DAN202U
D401	8-719-941-86	DIODE	DAN202U
D402	8-719-404-46	DIODE	MA110

< IC >

IC001	8-759-999-02	IC	TL1596CDSB
IC101	8-759-012-00	IC	MC10H116M
IC201	8-752-036-19	IC	CXA1207R
IC202	8-752-333-24	IC	CXL1506M
IC203	8-752-036-20	IC	CXA1208R
IC204	8-759-605-61	IC	CXA1203N
IC205	8-759-710-29	IC	NJM2235M
IC206	8-759-320-76	IC	HA118070FPTR
IC207	8-759-711-71	IC	NJM2234M
IC400	8-759-823-19	IC	CXA-1488R
IC401	8-759-823-19	IC	CXA-1536Q
IC402	8-759-823-19	IC	CXA-1488R
IC403	8-759-603-27	IC	M5201FP
IC405	8-759-009-22	IC	MC14094BF

< TRANSISTOR >

Q001	8-729-905-23	TRANSISTOR	2SA1576
Q002	8-729-905-35	TRANSISTOR	2SC4081
Q004	8-729-905-35	TRANSISTOR	2SC4081
Q005	8-729-905-35	TRANSISTOR	2SC4081
Q060	8-729-905-18	TRANSISTOR	DTC144EU
Q061	8-729-905-18	TRANSISTOR	DTC144EU
Q062	8-729-905-18	TRANSISTOR	DTC144EU
Q063	8-729-905-12	TRANSISTOR	DTA144EU
Q101	8-729-905-23	TRANSISTOR	2SA1576
Q102	8-729-905-18	TRANSISTOR	DTC144EU

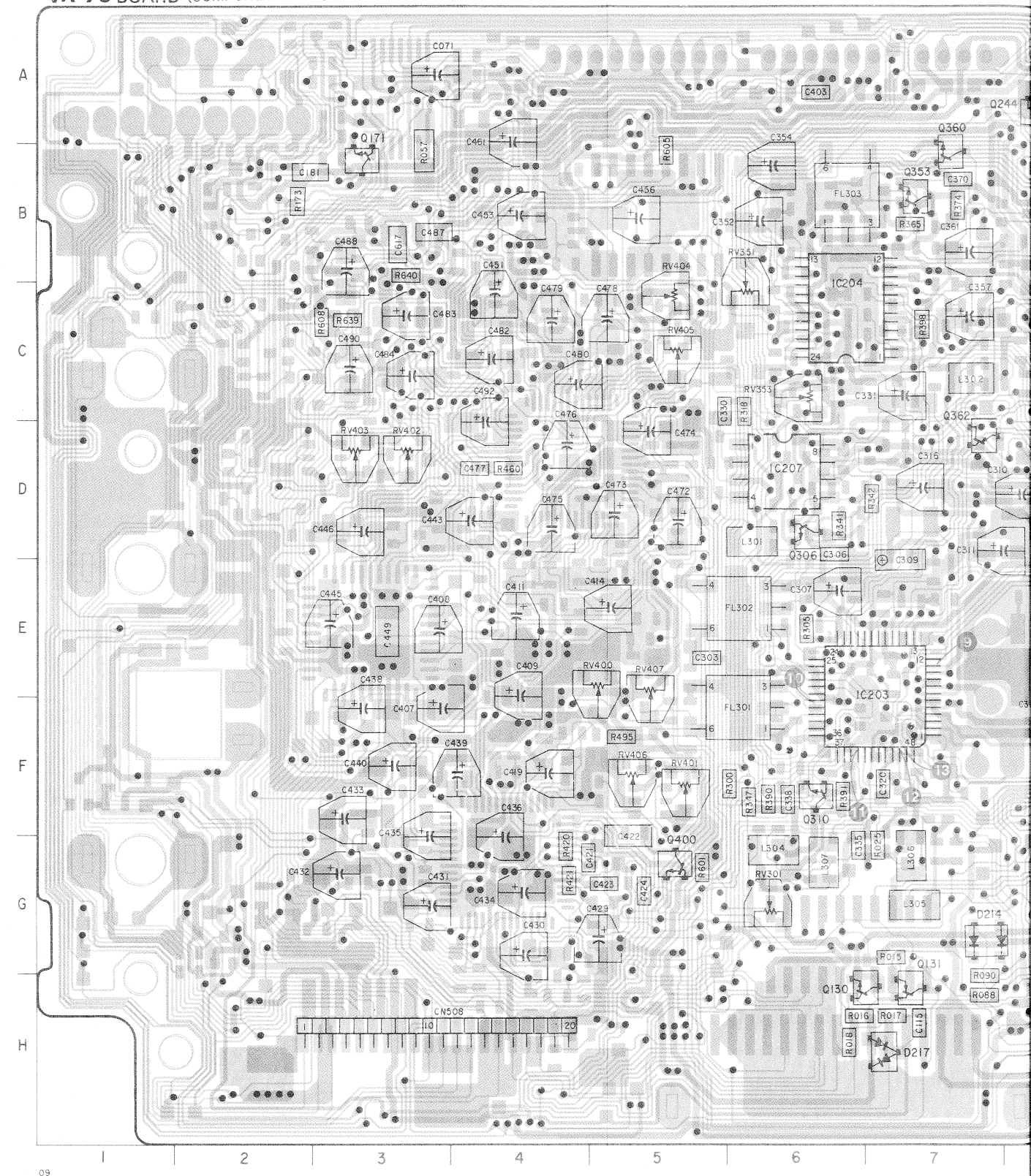
Q105	8-729-905-35	TRANSISTOR	2SC4081
Q106	8-729-102-07	TRANSISTOR	2SC2223
Q107	8-729-905-12	TRANSISTOR	DTA144EU
Q109	8-729-905-35	TRANSISTOR	2SC4081
Q115	8-729-905-35	TRANSISTOR	2SC4081
Q116	8-729-905-18	TRANSISTOR	DTC144EU
Q117	8-729-905-35	TRANSISTOR	2SC4081
Q118	8-729-905-23	TRANSISTOR	2SA1576
Q119	8-729-905-35	TRANSISTOR	2SC4081
Q121	8-729-141-48	TRANSISTOR	2SB624T1-BV345
Q122	8-729-102-07	TRANSISTOR	2SC2223
Q123	8-729-905-35	TRANSISTOR	2SC4081
Q130	8-729-905-35	TRANSISTOR	2SC4081
Q131	8-729-905-23	TRANSISTOR	2SA1576
Q140	8-729-905-12	TRANSISTOR	DTA144EU
Q141	8-729-905-35	TRANSISTOR	2SC4081
Q142	8-729-101-07	TRANSISTOR	2SB798-DLDC
Q154	8-729-905-35	TRANSISTOR	2SC4081
Q171	8-729-905-35	TRANSISTOR	2SC4081
Q172	8-729-905-35	TRANSISTOR	2SC4081
Q191	8-729-905-35	TRANSISTOR	2SC4081
Q192	8-729-905-18	TRANSISTOR	DTC144EU
Q195	8-729-905-12	TRANSISTOR	DTA144EU
Q196	8-729-905-18	TRANSISTOR	DTC144EU
Q201	8-729-905-35	TRANSISTOR	2SC4081
Q202	8-729-905-12	TRANSISTOR	DTA144EU
Q203	8-729-905-23	TRANSISTOR	2SA1576
Q204	8-729-905-35	TRANSISTOR	2SC4081
Q205	8-729-905-18	TRANSISTOR	DTC144EU
Q206	8-729-905-35	TRANSISTOR	2SC4081
Q209	8-729-905-18	TRANSISTOR	DTC144EU
Q210	8-729-905-23	TRANSISTOR	2SA1576
Q211	8-729-905-35	TRANSISTOR	2SC4081
Q212	8-729-905-35	TRANSISTOR	2SC4081
Q215	8-729-905-23	TRANSISTOR	2SA1576
Q216	8-729-905-18	TRANSISTOR	DTC144EU
Q220	8-729-141-48	TRANSISTOR	2SB624T1-BV345
Q221	8-729-905-18	TRANSISTOR	DTC144EU
Q222	8-729-905-12	TRANSISTOR	DTA144EU
Q223	8-729-905-35	TRANSISTOR	2SC4081
Q224	8-729-905-35	TRANSISTOR	2SC4081
Q225	8-729-905-12	TRANSISTOR	DTA144EU
Q226	8-729-905-35	TRANSISTOR	2SC4081
Q227	8-729-905-35	TRANSISTOR	2SC4081
Q228	8-729-905-23	TRANSISTOR	2SA1576
Q229	8-729-905-35	TRANSISTOR	2SC4081
Q231	8-729-905-35	TRANSISTOR	2SC4081
Q232	8-729-905-35	TRANSISTOR	2SC4081
Q238	8-729-905-23	TRANSISTOR	2SA1576
Q240	8-729-905-35	TRANSISTOR	2SC4081

Q241	8-729-905-23	TRANSISTOR	2SA1576
Q244	8-729-905-18	TRANSISTOR	DTC144EU
Q245	8-729-905-XX	TRANSISTOR	DTC114TU
Q246	8-729-905-XX	TRANSISTOR	DTC114TU
Q247	8-729-905-XX	TRANSISTOR	DTC114TU
Q248	8-729-905-18	TRANSISTOR	DTC144EU
Q250	8-729-905-35	TRANSISTOR	2SC4081
Q251	8-729-905-18	TRANSISTOR	DTC144EU
Q252	8-729-905-18	TRANSISTOR	DTC144EU
Q254	8-729-905-35	TRANSISTOR	2SC4081
Q301	8-729-905-23	TRANSISTOR	2SA1576
Q303	8-729-905-35	TRANSISTOR	2SC4081
Q304	8-729-905-35	TRANSISTOR	2SC4081
Q306	8-729-905-35	TRANSISTOR	2SC4081
Q307	8-729-905-18	TRANSISTOR	DTC144EU
Q310	8-729-905-35	TRANSISTOR	2SC4081
Q311	8-729-905-35	TRANSISTOR	2SC4081
Q351	8-729-905-35	TRANSISTOR	2SC4081
Q352	8-729-905-35	TRANSISTOR	2SC4081
Q353	8-729-905-35	TRANSISTOR	2SC4081
Q354	8-729-905-35	TRANSISTOR	2SC4081
Q356	8-729-905-18	TRANSISTOR	DTC144EU
Q357	8-729-905-12	TRANSISTOR	DTA144EU
Q358	8-729-905-18	TRANSISTOR	DTC144EU
Q359	8-729-102-08	TRANSISTOR	2SC2223-F14
Q360	8-729-905-18	TRANSISTOR	DTC144EU
Q362	8-729-905-18	TRANSISTOR	DTC144EU
Q400	8-729-905-18	TRANSISTOR	DTC144EU
Q401	8-729-905-18	TRANSISTOR	DTC144EU
Q402	8-729-905-35	TRANSISTOR	2SC4081
Q403	8-729-904-07	TRANSISTOR	FMG2
Q404	8-729-904-07	TRANSISTOR	FMG2
Q405	8-729-905-18	TRANSISTOR	DTC144EU
Q406	8-729-905-18	TRANSISTOR	DTC144EU
Q407	8-729-905-XX	TRANSISTOR	DTC114TU
Q408	8-729-905-XX	TRANSISTOR	DTC114TU
Q409	8-729-216-22	TRANSISTOR	2SA1162
Q410	8-729-907-39	TRANSISTOR	IMD2T
Q412	8-729-402-81	TRANSISTOR	XN4501
Q413	8-729-905-18	TRANSISTOR	DTC144EU
Q414	8-729-904-07	TRANSISTOR	FMG2
Q415	8-729-905-23	TRANSISTOR	2SA1576R

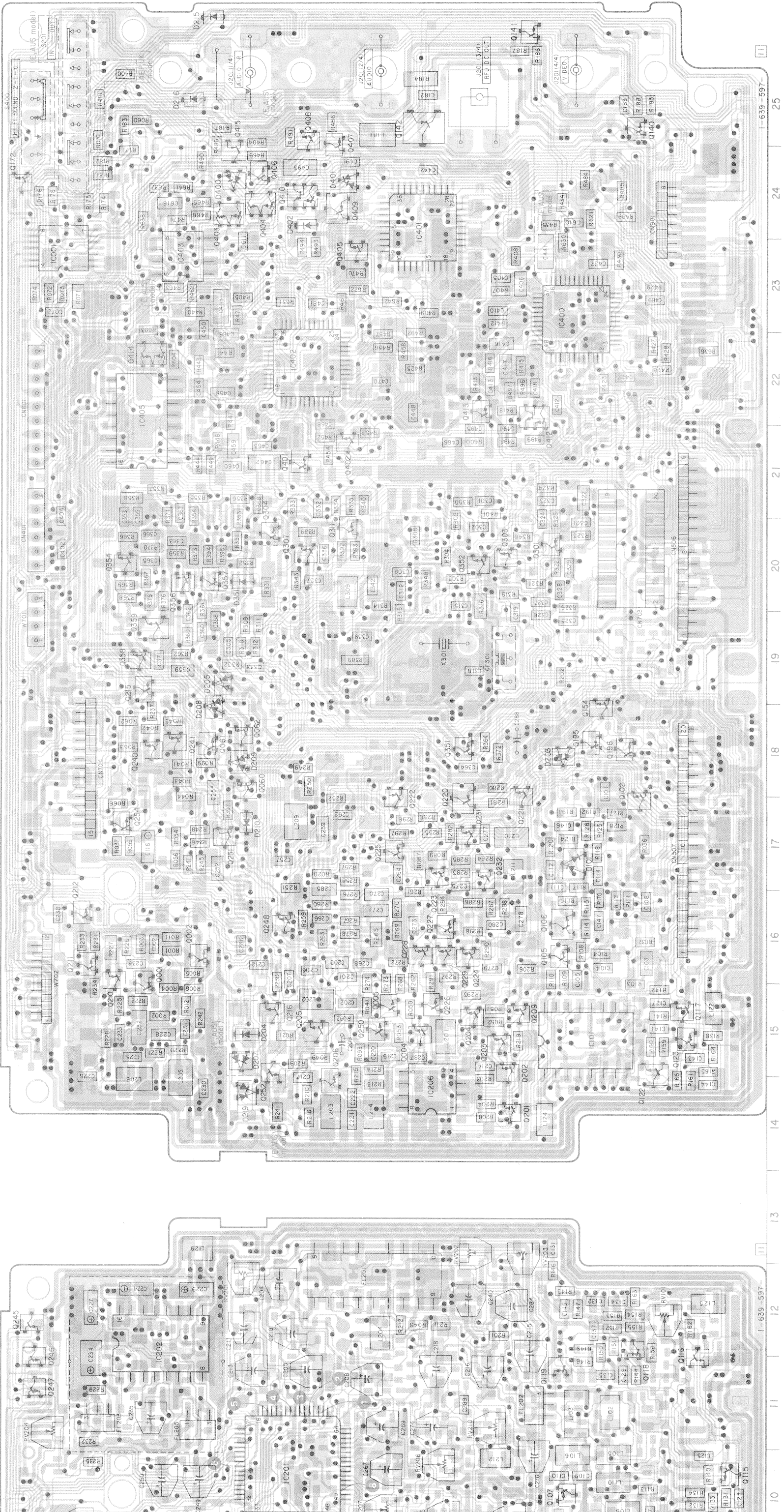
VA-70 (VIDEO PROCESS, AUDIO PROCESS) PRINTED WIRING BOARD

— Ref. No. VA-70 BOARD: 1000 series —

VA-70 BOARD (COMPONENT SIDE)



VA-70 BOARD (CONDUCTOR SIDE)



VA-70 (2/2) (AUDIO PROCESS) SCHEMATIC DIAGRAM

— Ref. No. VA-70 (2/2) BOARD: 1000 series —

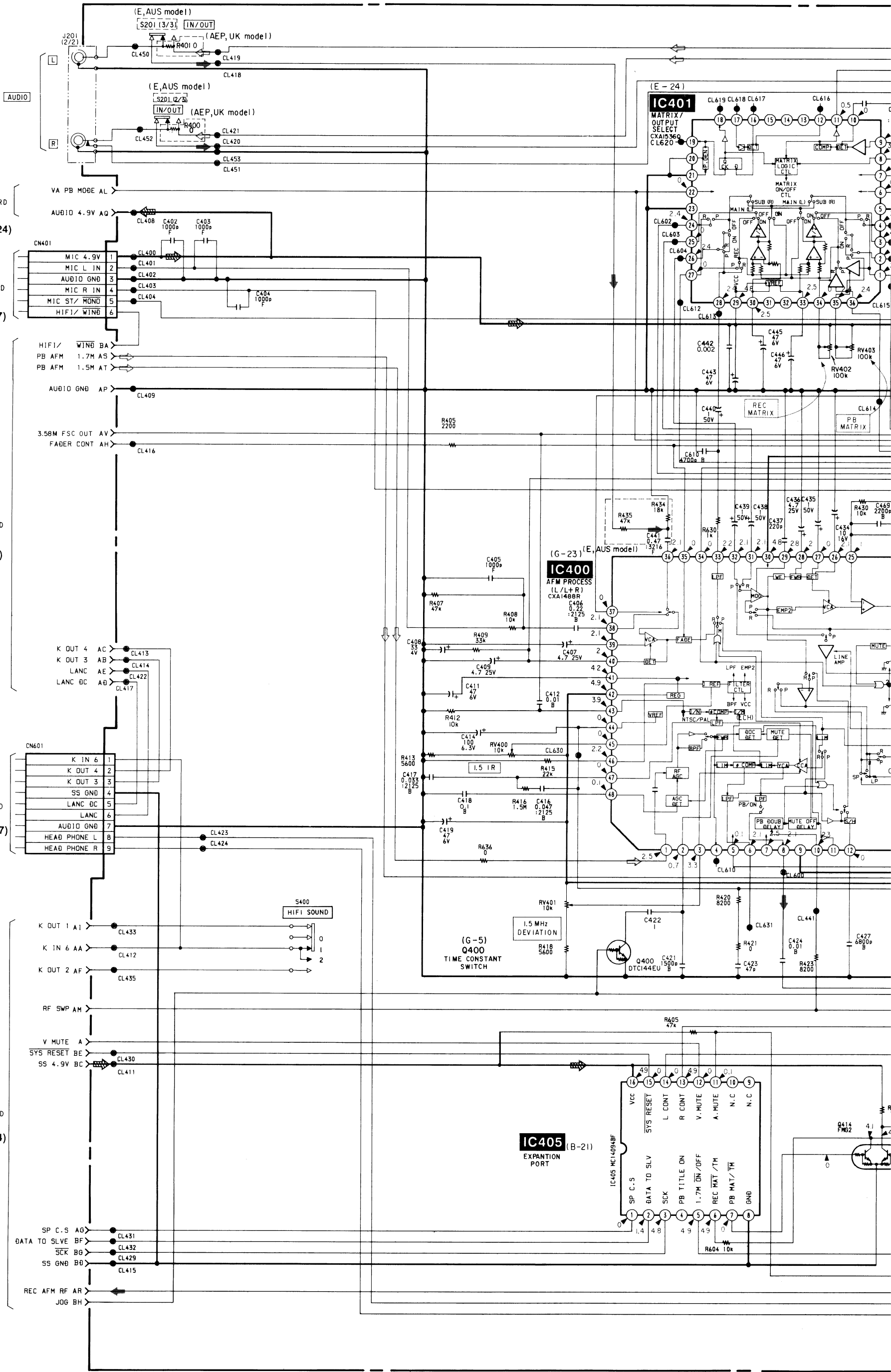
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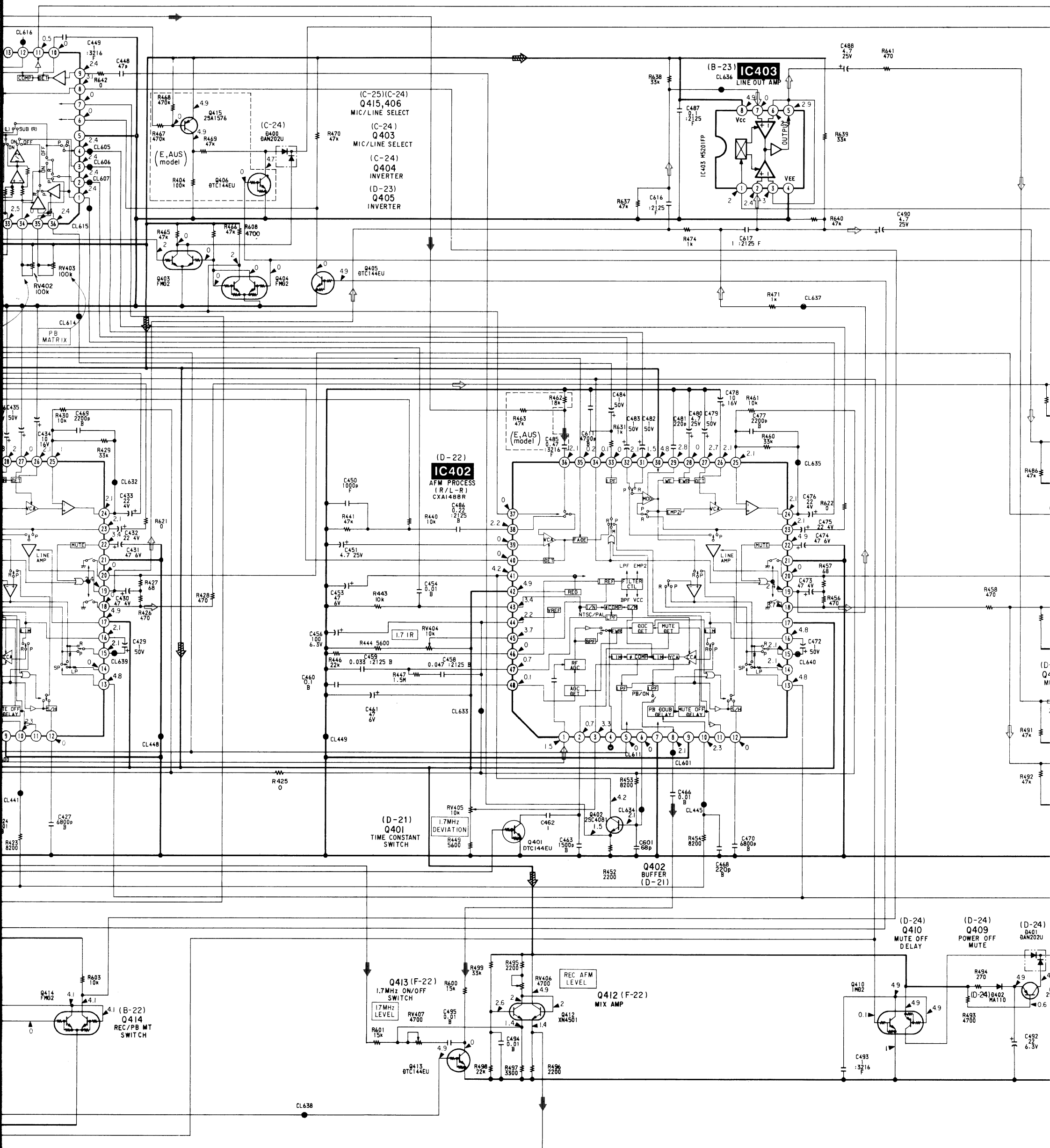
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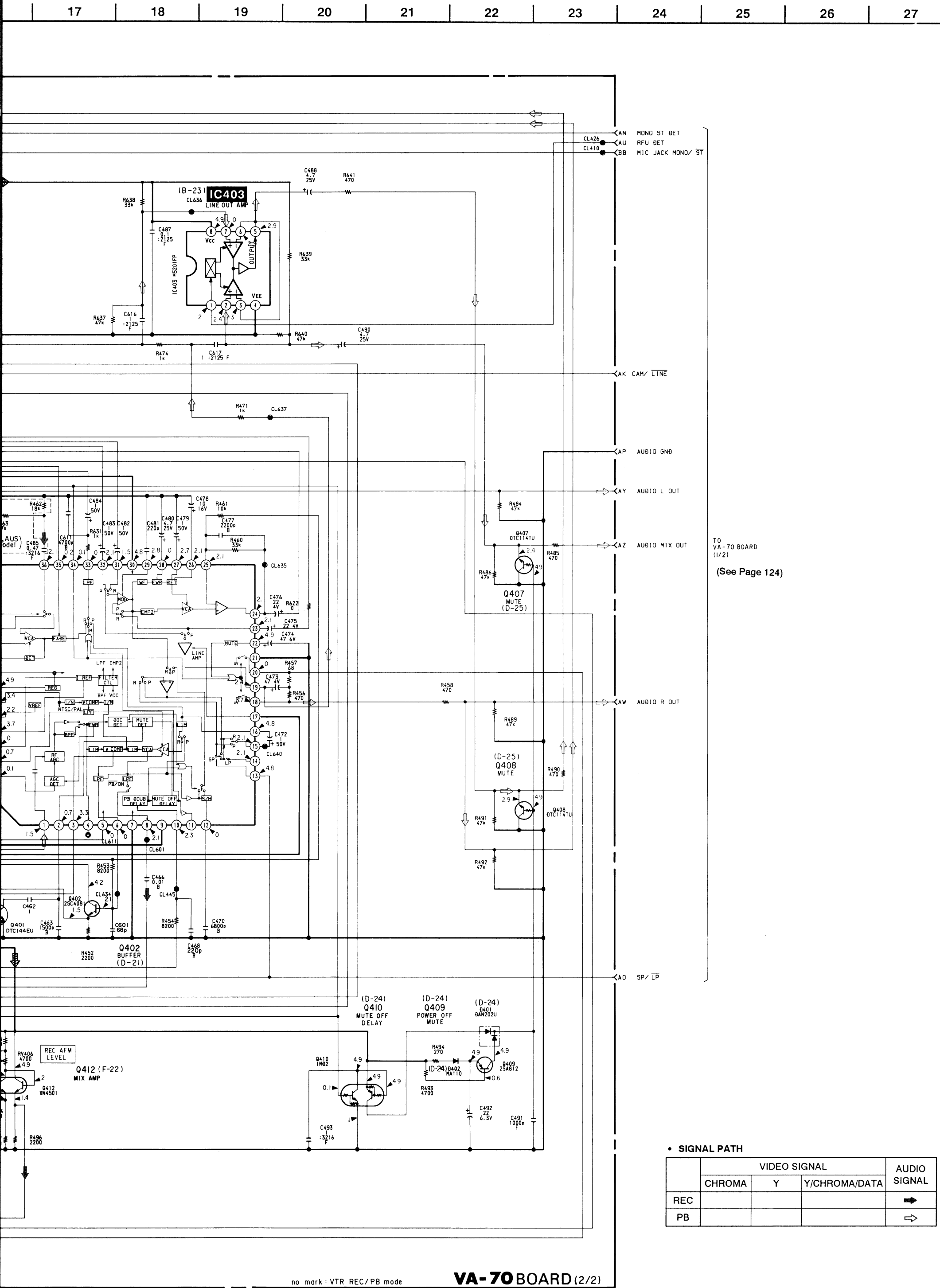
(See Page 124)

(See Page 147)

(See Page 124)







TO
VA-70 BOARD
(1/2)
(See Page 124)

— Ref. No. MC-82 BOARD: 2000 series, SW-175 BOARD: 2000 series —

< DIODE >			
D652	8-719-106-43	DIODE	RD9.1M
D655	8-719-404-46	DIODE	MA110
< IC >			
IC650	8-759-822-37	IC	LA7293M-TE-L
IC651	8-759-822-37	IC	LA7293M-TE-L
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Q650	8-729-109-44	TRANSISTOR	2SK94
Q651	8-729-905-35	TRANSISTOR	2SC4081
Q653	8-729-905-35	TRANSISTOR	2SC4081
Q654	8-729-905-12	TRANSISTOR	DTA144EU
Q655	8-729-905-12	TRANSISTOR	DTA144EU
< TRANSISTOR >			
Q656	8-729-109-44	TRANSISTOR	2SK94
Q657	8-729-905-35	TRANSISTOR	2SC4081
Q658	8-729-904-07	TRANSISTOR	FMG2-T-149
Q659	8-729-905-35	TRANSISTOR	2SC4081

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* A-7071-428-A SW-175P BOARD, COMPLETE

 (Ref. No 2,000 Series)

< DIODE >

D900 8-719-977-34 DIODE DTZ12
 D901 8-719-977-34 DIODE DTZ12
 D902 8-719-404-46 DIODE MA110

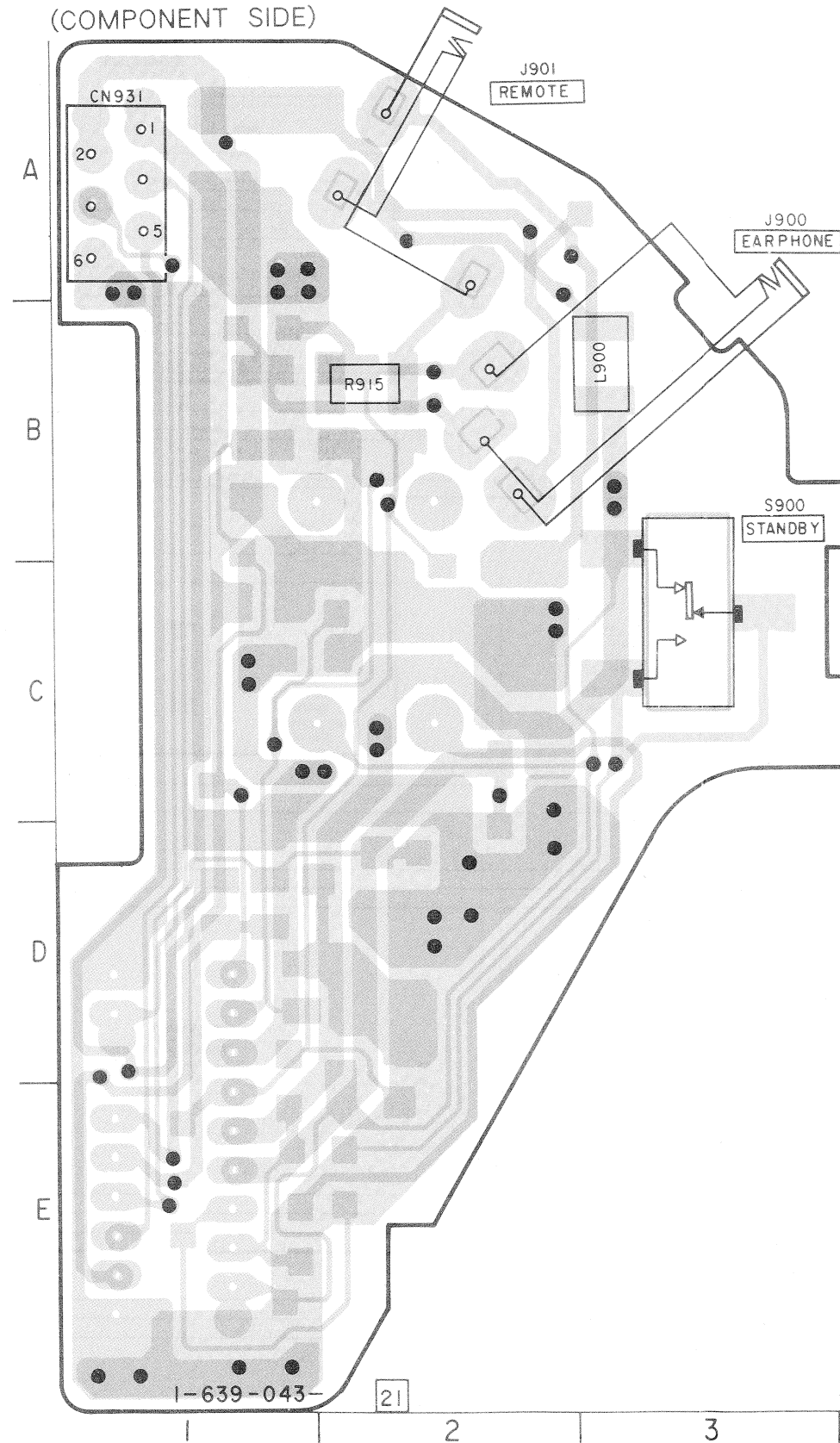
D903 8-719-977-34 DIODE DTZ12
 D904 8-719-977-34 DIODE DTZ12

D905 8-719-404-46 DIODE MA110
 D906 8-719-404-46 DIODE MA110
 D907 8-719-404-46 DIODE MA110
 D908 8-719-976-97 DIODE DTZ5.1

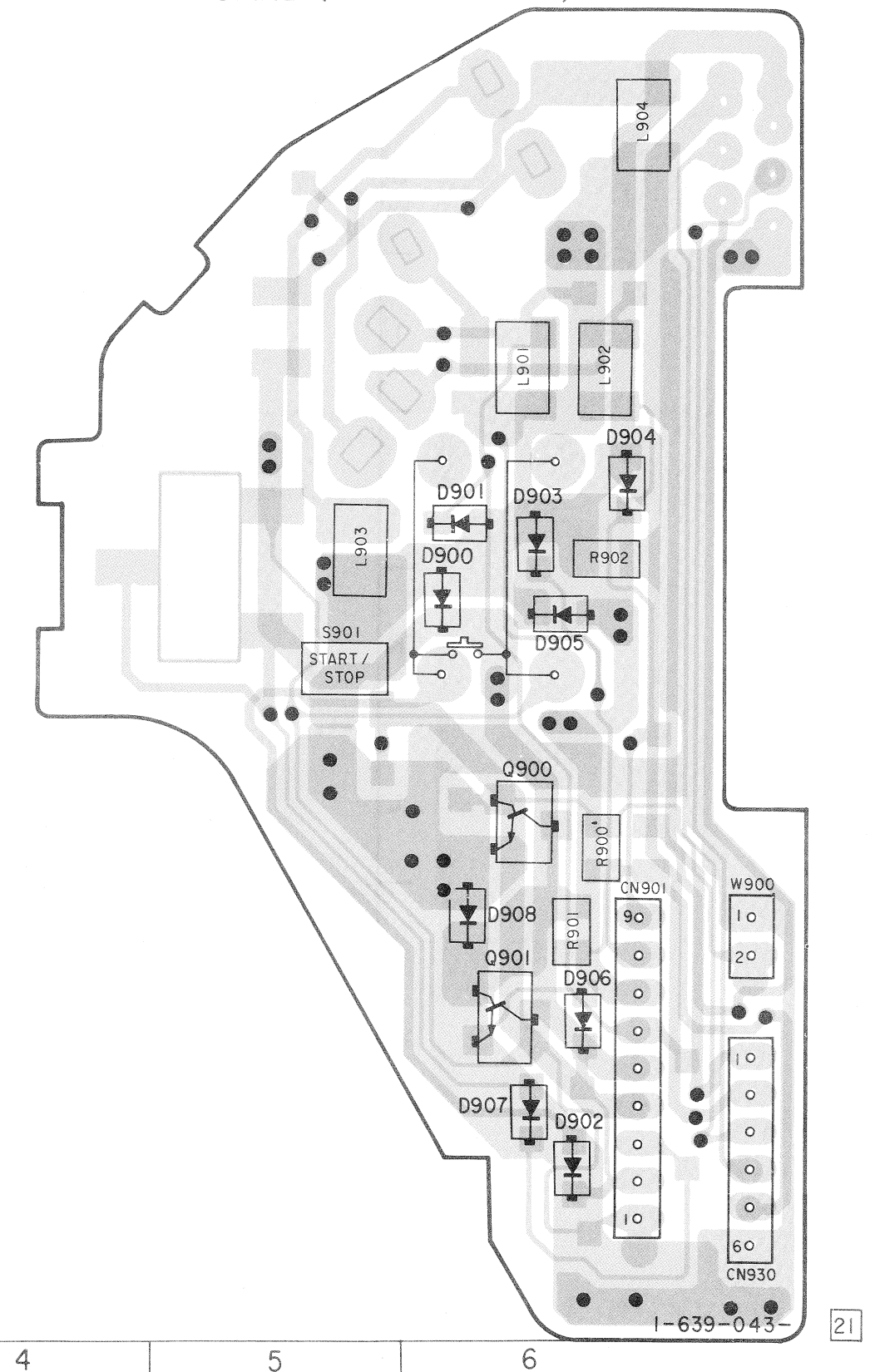
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Q900 8-729-901-01 TRANSISTOR DTC144EK
 Q901 8-729-902-XX TRANSISTOR DTC114TK

SW-175 BOARD
 (COMPONENT SIDE)



SW-175 BOARD (CONDUCTOR SIDE)



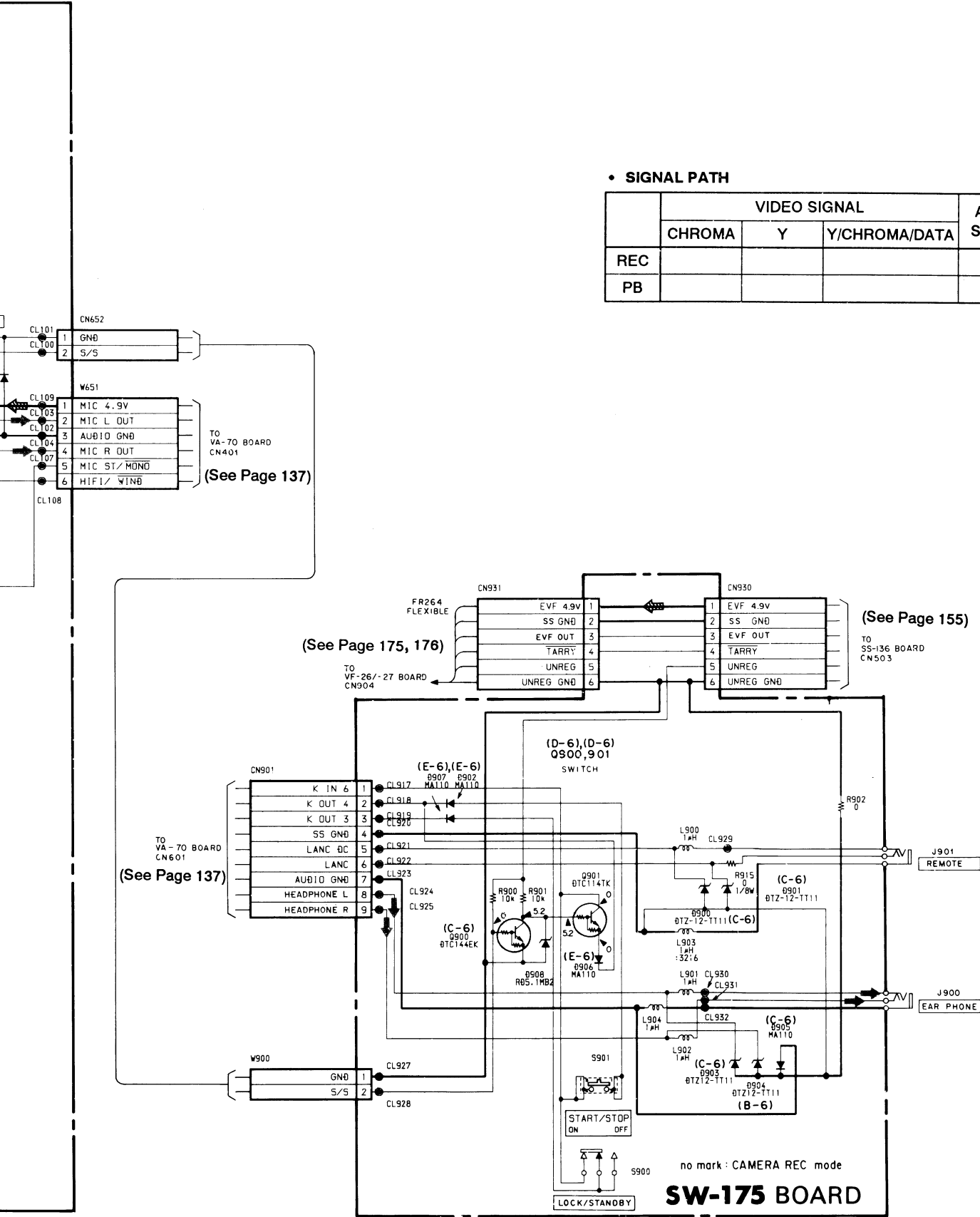
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A	
B	
C	
D	
E	
F	
G	
H	
I	
J	



• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC				➡
PB				➡



SS-136 (SERVO/SYSTEM CONTROL), RP-77 (VIDEO HEAD AMP) PRINTED WIRING BOARDS

— Ref. No. SS-136 BOARD: 3000 series —

RP-77 board is replaced as a block, so that the PRINTED WIRING BOARD of it is omitted.

* A-7062-778-A SS-136 (PB) BOARD, COMPLETE

(Ref.No 3,000 Series)

< DIODE >

D501	8-719-941-86	DIODE	DAN202U
D506	8-719-941-86	DIODE	DAN202U
D510	8-719-404-46	DIODE	MA110
D901	8-719-938-75	DIODE	SB05-05CP
D902	8-719-938-75	DIODE	SB05-05CP
D903	8-719-938-78	DIODE	SB10-05PCP

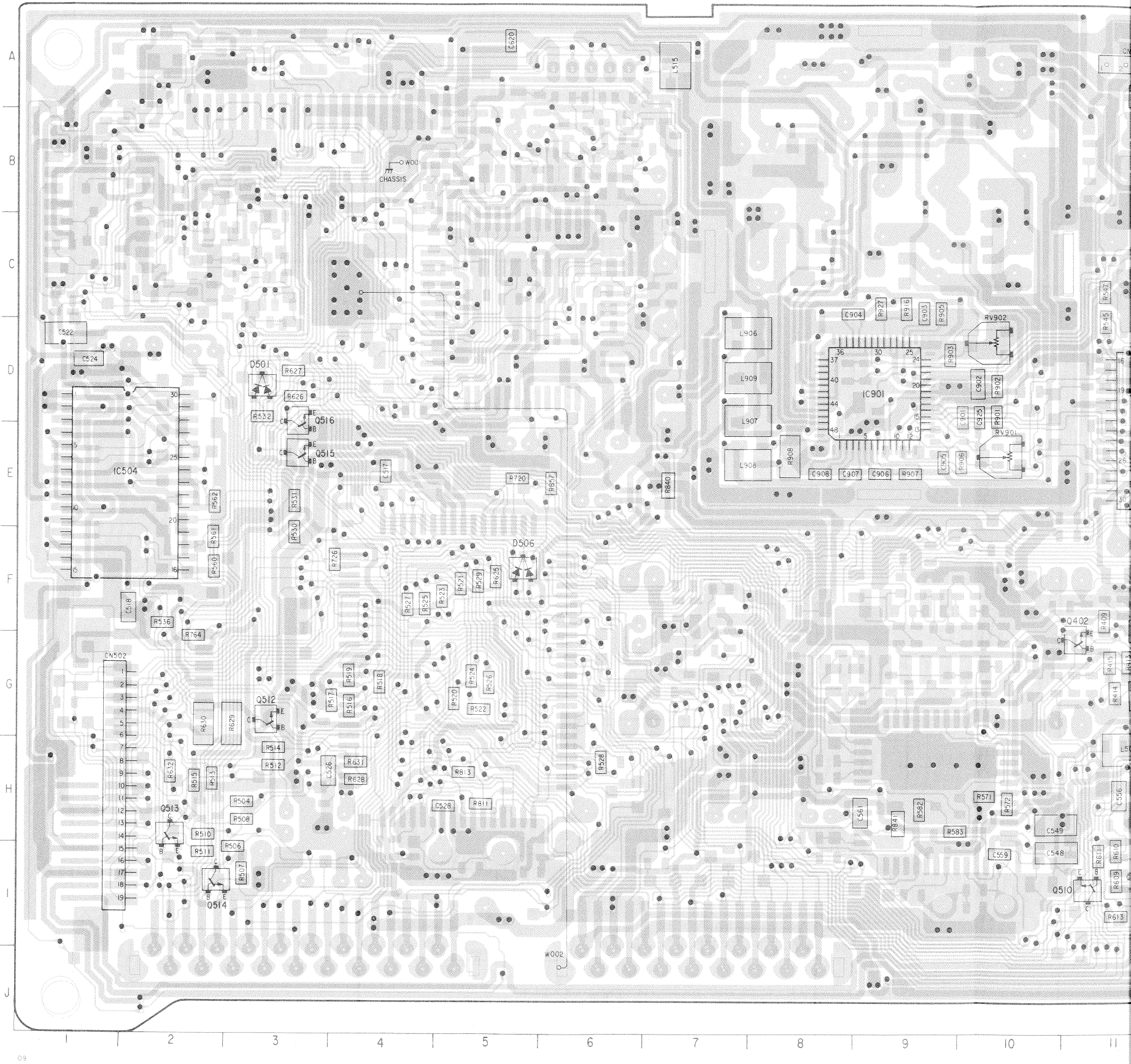
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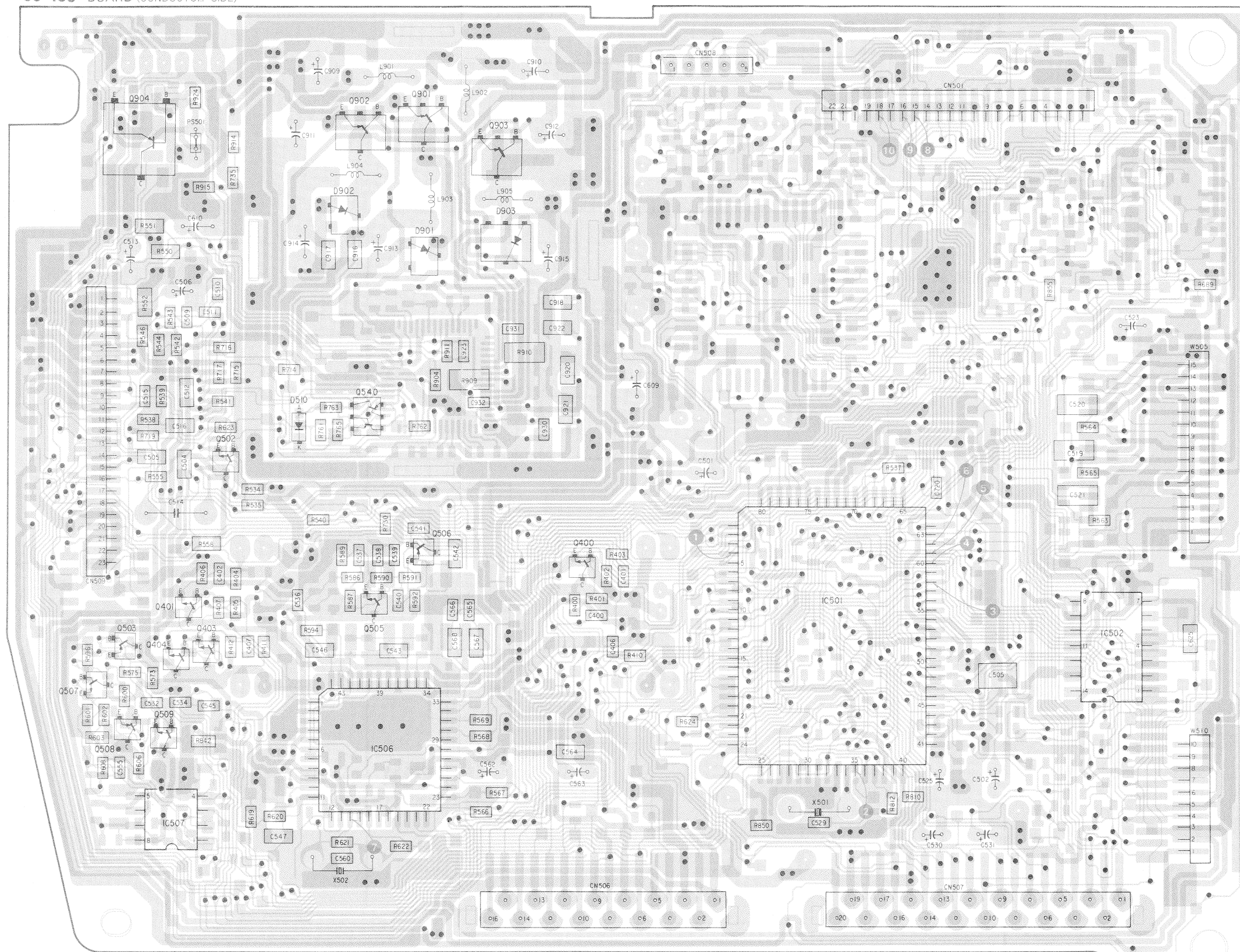
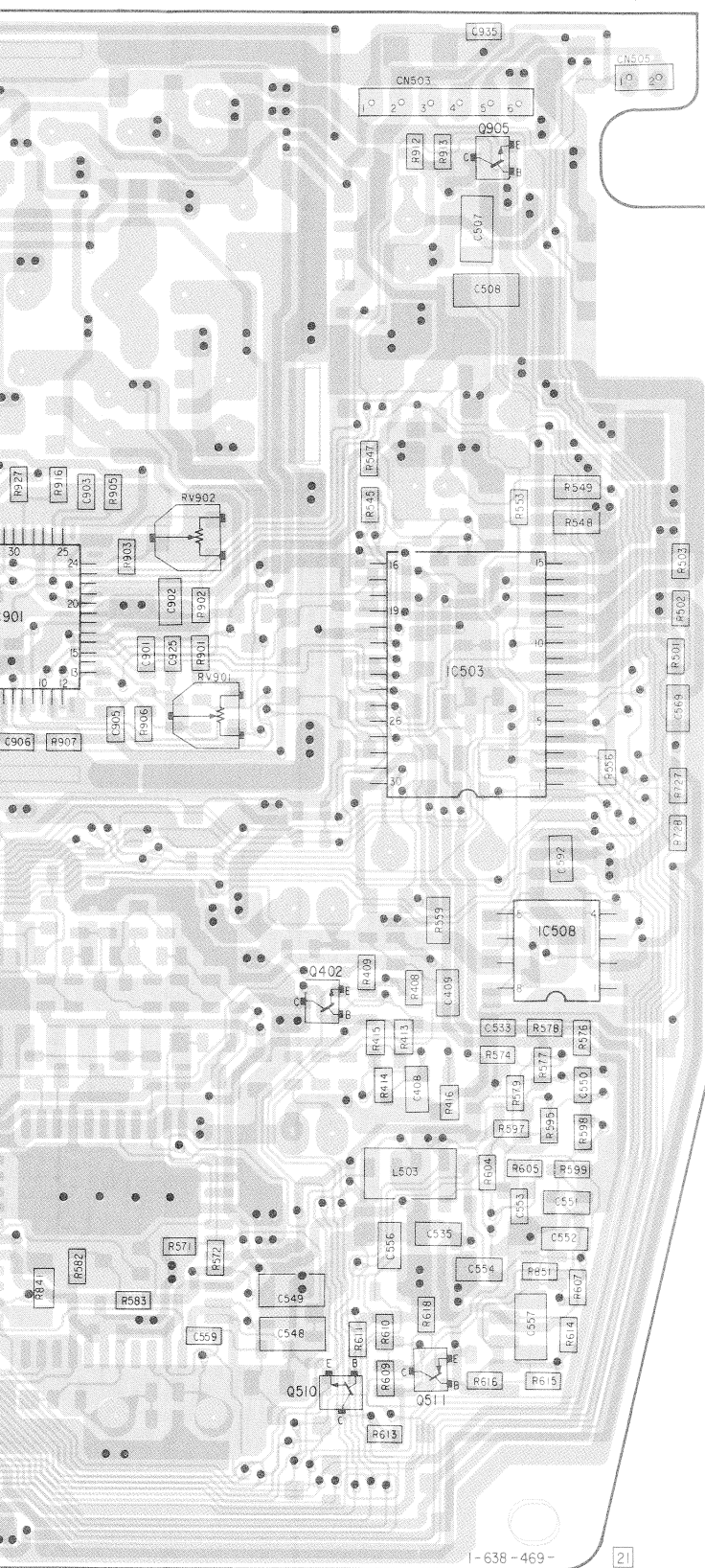
IC501	8-752-818-70	IC	CXP80116-830Q
IC502	8-759-148-05	IC	CXA8010M
IC503	8-759-990-55	IC	CXA8006M
IC504	8-752-056-72	IC	CXA1127M
IC506	8-752-055-48	IC	CXA1204Q
IC507	8-759-100-93	IC	uPC393G2
IC507	8-759-509-91	IC	XRA10393F
IC507	8-759-998-92	IC	LM393DR
IC508	8-759-748-72	IC	BR93C46F
IC508	8-759-979-38	IC	AK93C46F
IC901	8-759-500-42	IC	MB3783PFV

< TRANSISTOR >

Q400	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q401	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q402	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q403	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q404	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q502	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q503	8-729-905-24	TRANSISTOR	2SA1576T106S
Q505	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q506	8-729-905-24	TRANSISTOR	2SA1576T106S
Q507	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q508	8-729-905-24	TRANSISTOR	2SA1576T106S
Q509	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q510	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q511	8-729-905-24	TRANSISTOR	2SA1576T106S
Q512	8-729-907-00	TRANSISTOR	DTC114EU
Q513	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q514	8-729-905-35	TRANSISTOR	2SC4081T106Q
Q515	8-729-905-18	TRANSISTOR	DTC144EU
Q516	8-729-905-18	TRANSISTOR	DTC144EU
Q540	8-729-822-48	TRANSISTOR	FC101-TR
Q901	8-729-805-25	TRANSISTOR	2SB1121-ST-TD
Q902	8-729-805-25	TRANSISTOR	2SB1121-ST-TD
Q903	8-729-805-25	TRANSISTOR	2SB1121-ST-TD
Q904	8-729-820-47	TRANSISTOR	2SB1202FAT-TL
Q905	8-729-905-35	TRANSISTOR	2SC4081T106Q

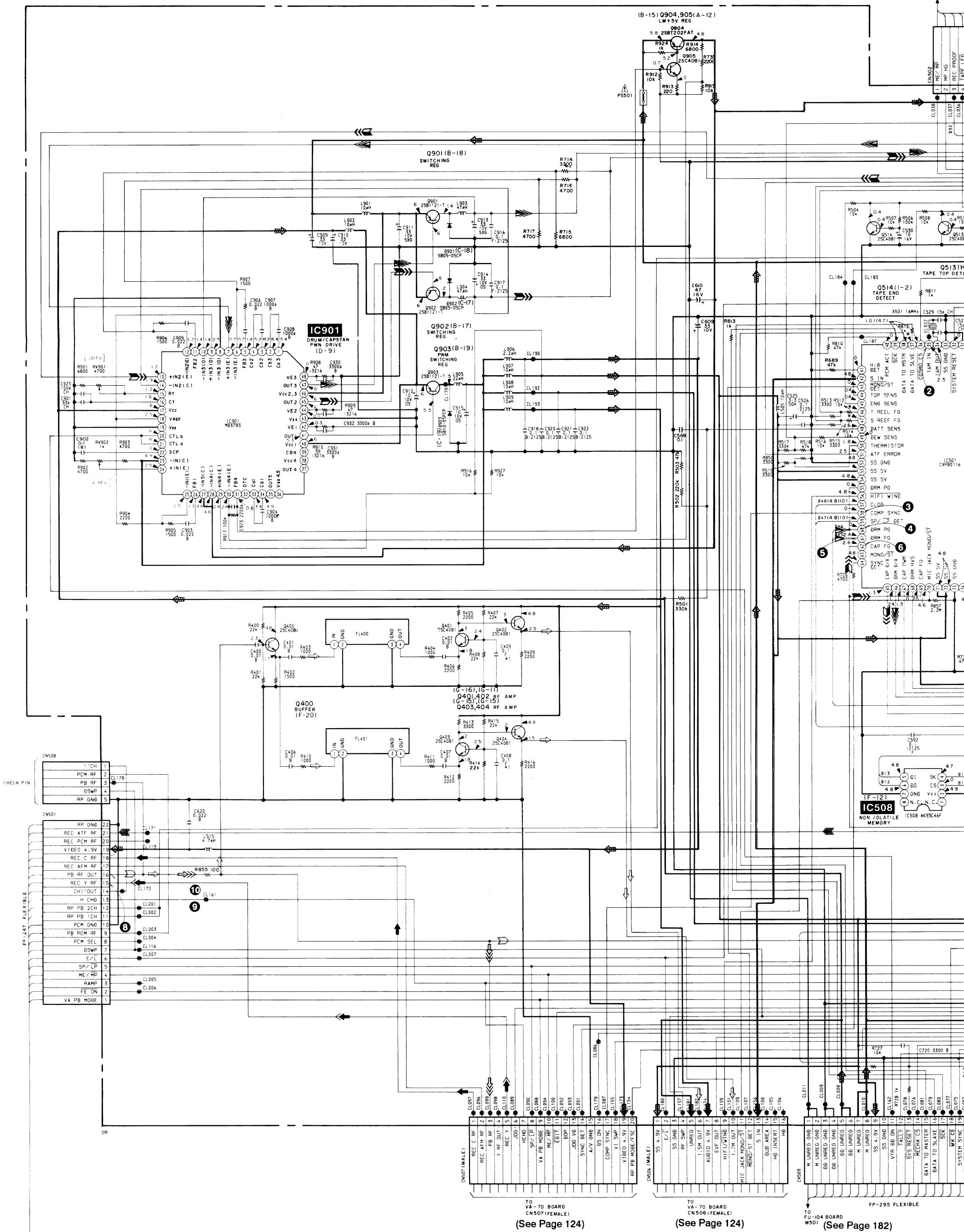
SS-136 BOARD (COMPONENT SIDE)





— Ref. No. SS-136 BOARD: 3000 series —

(See Page 16)



(See Page 124)

(See Page 124)

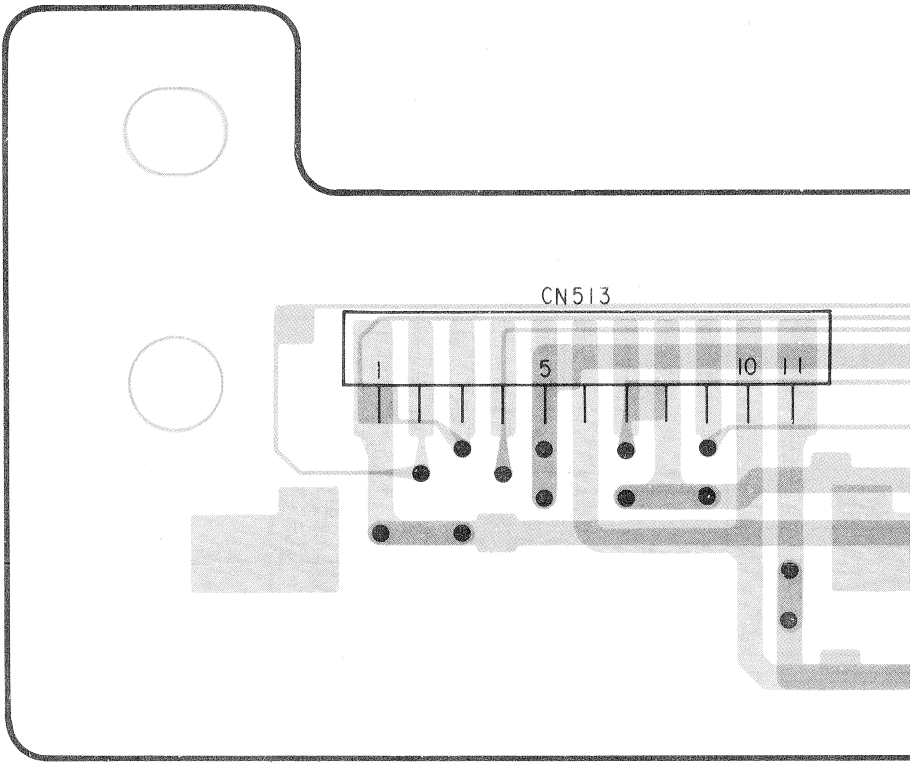
(See Page 182)

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CC-61 (LINK), FP-89 (SENSOR), FP-90 (SENSOR) PRINTED WIRING BOARDS

— Ref. No. CC-61 BOARD: 10000 series, FP-89 BOARD: 11000 series, FP-90 BOARD: 12000 series —

CC-61 BOARD



* 1-628-060-12 FP-89 FLEXIBLE BOARD

(Ref. No 11,000 Series)

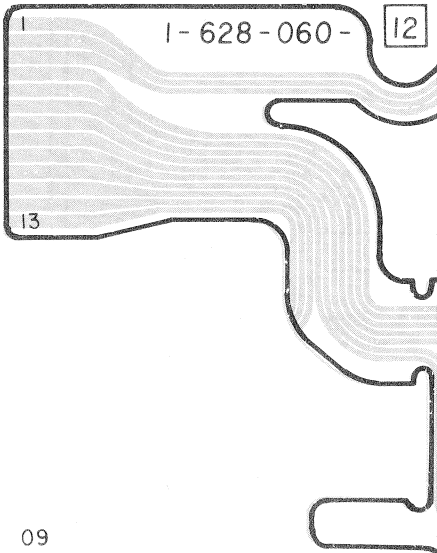
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D301 8-719-820-44 PHOTO COUPLER TLP907

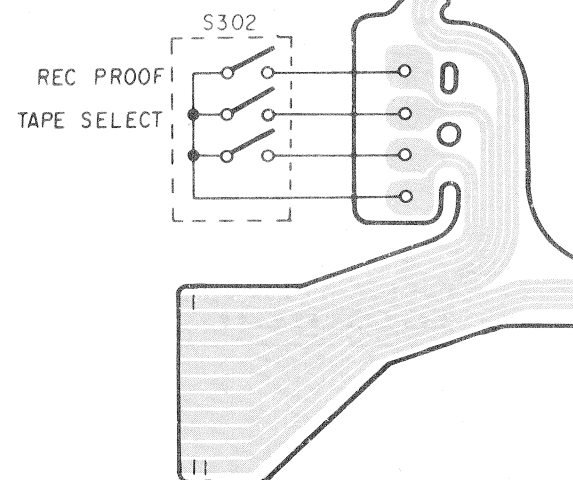
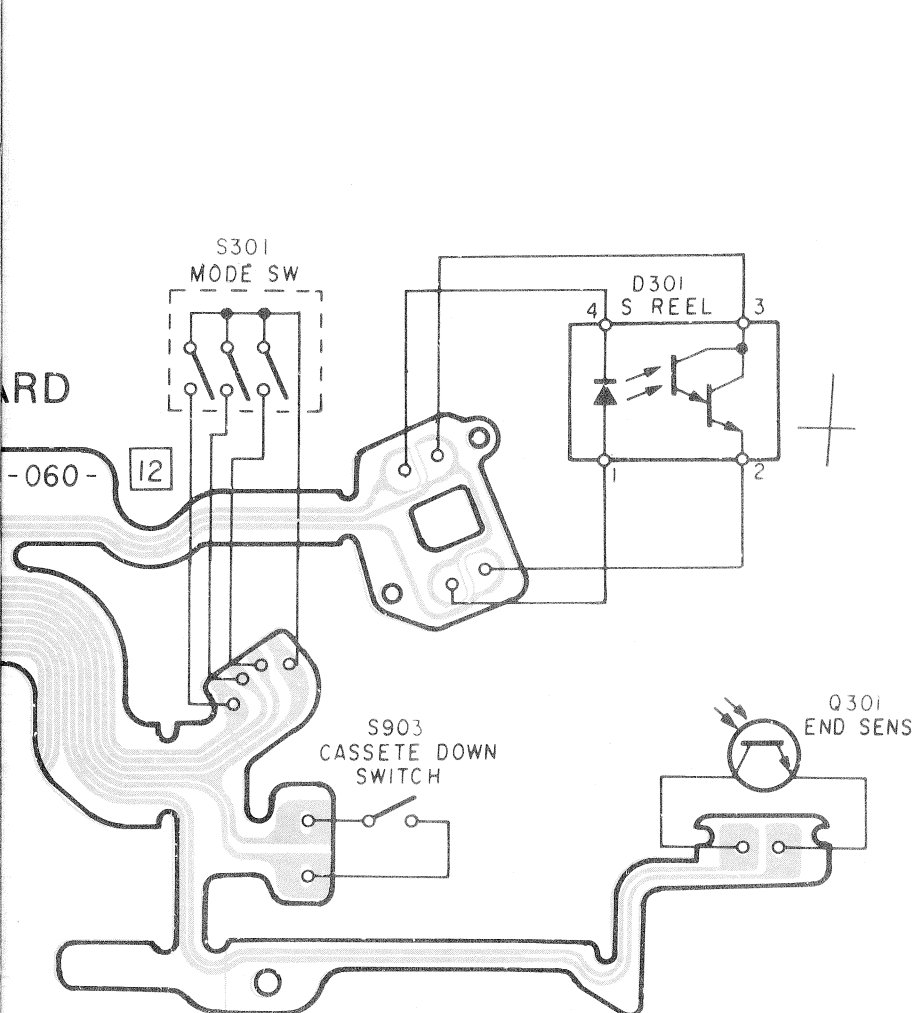
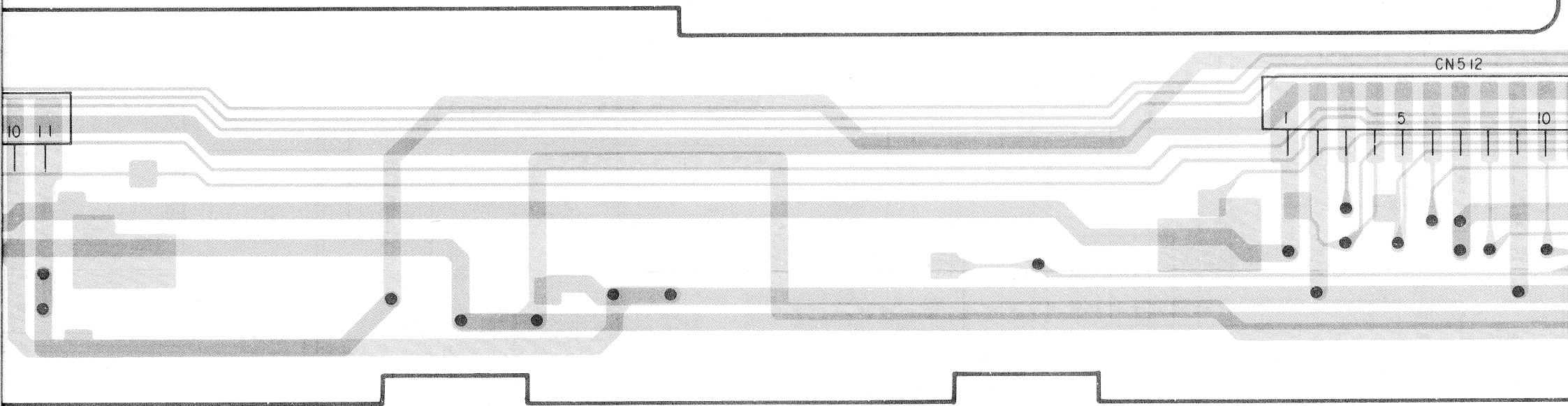
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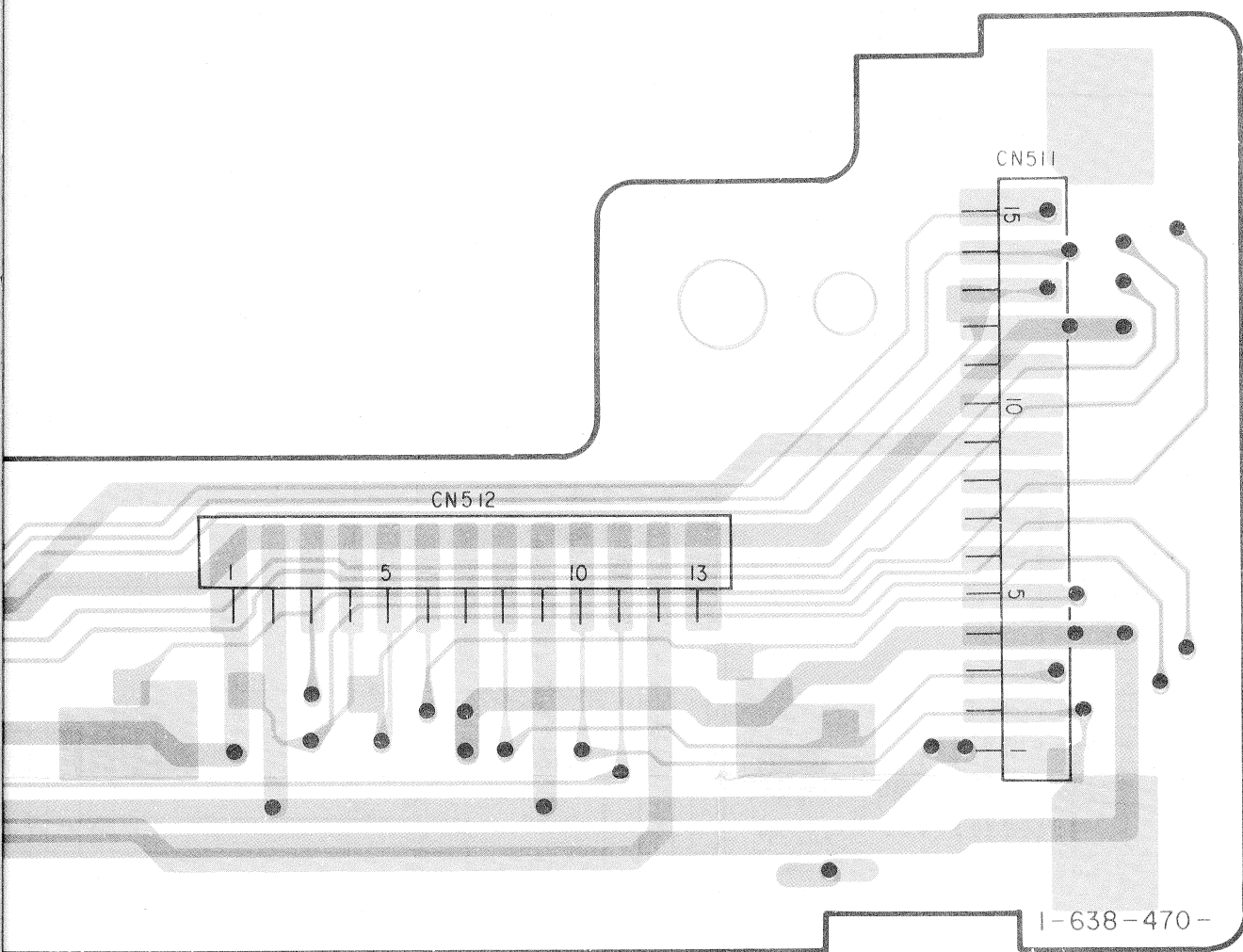
Q301 8-729-906-48 TRANSISTOR EE-TP109

FP-89 BOARD
(FLEXIBLE)

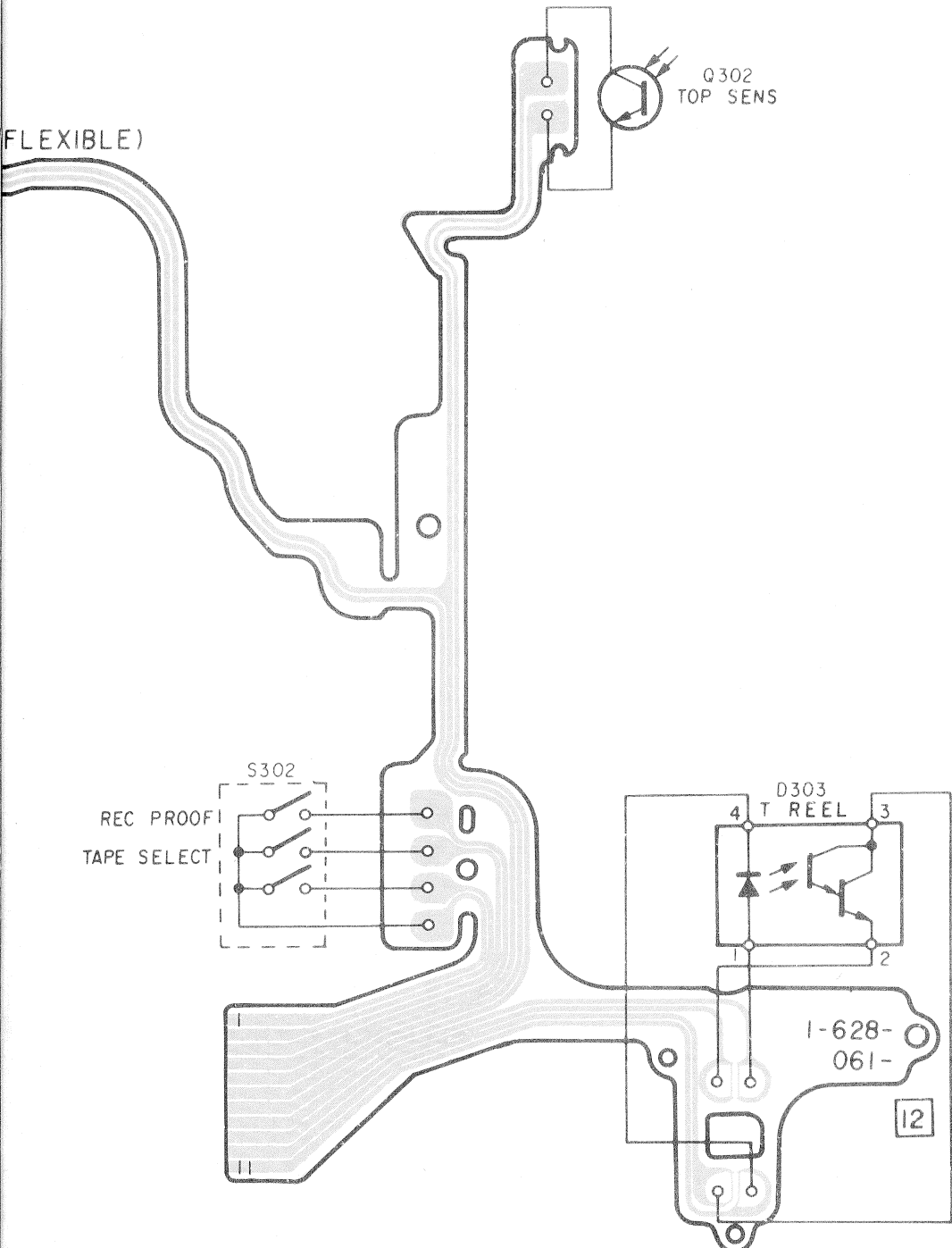


09





21



* 1-628-061-12 FP-90 FLEXIBLE BOARD

(Ref. No 12,000 Series)

< DIODE >

D302 8-719-940-81 DIODE GL452S

D303 8-719-820-44 PHOTO COUPLER TLP907

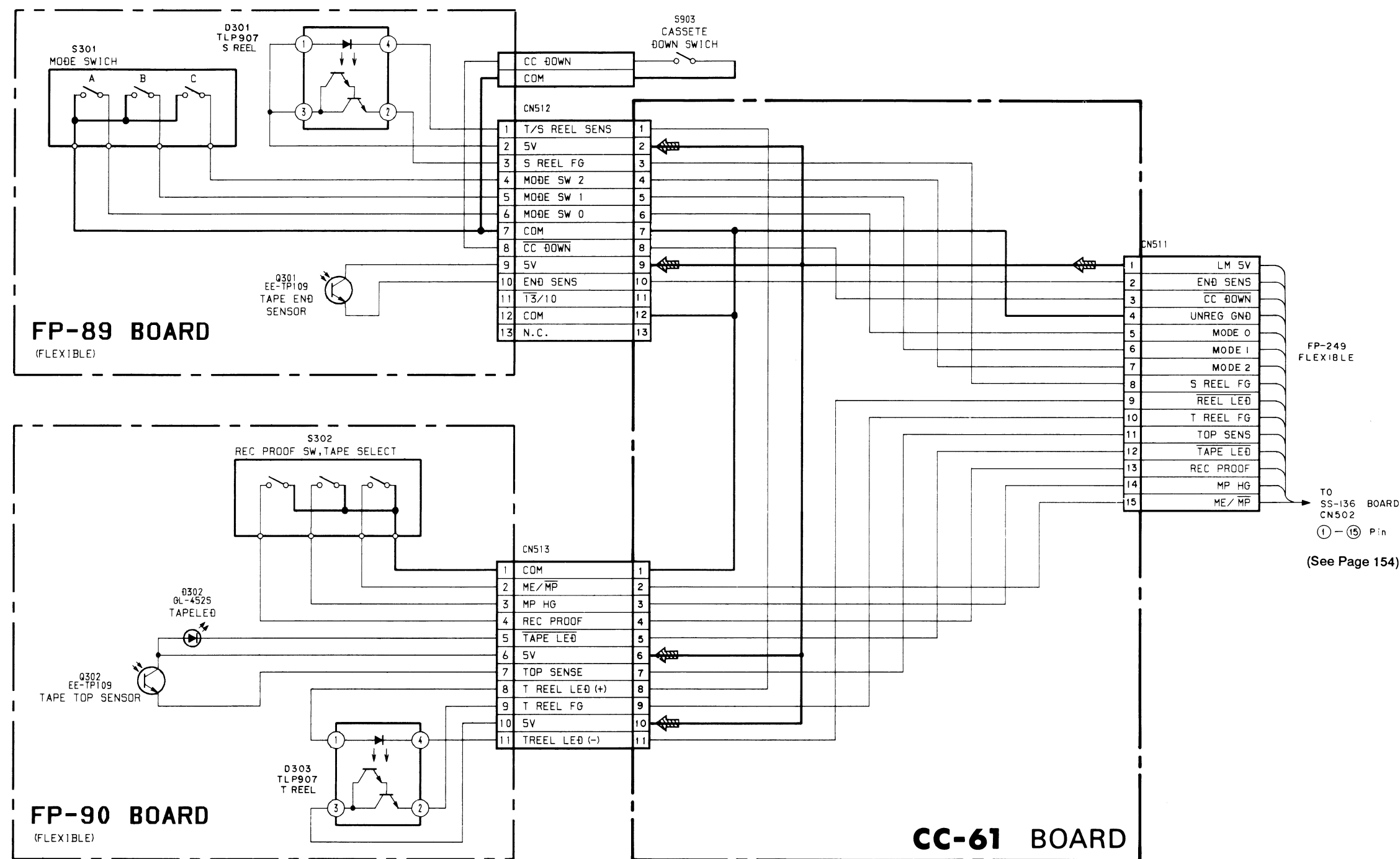
< TRANSISTOR >

Q302 8-729-906-48 TRANSISTOR EE-TP109

CC-61 (LINK), FP-89 (SENSOR), FP-90 (SENSOR) SCHEMATIC DIAGRAMS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

— Ref. No. CC-61 BOARD: 10000 series, FP-89 BOARD: 11000 series, FP-90 BOARD: 12000 series —

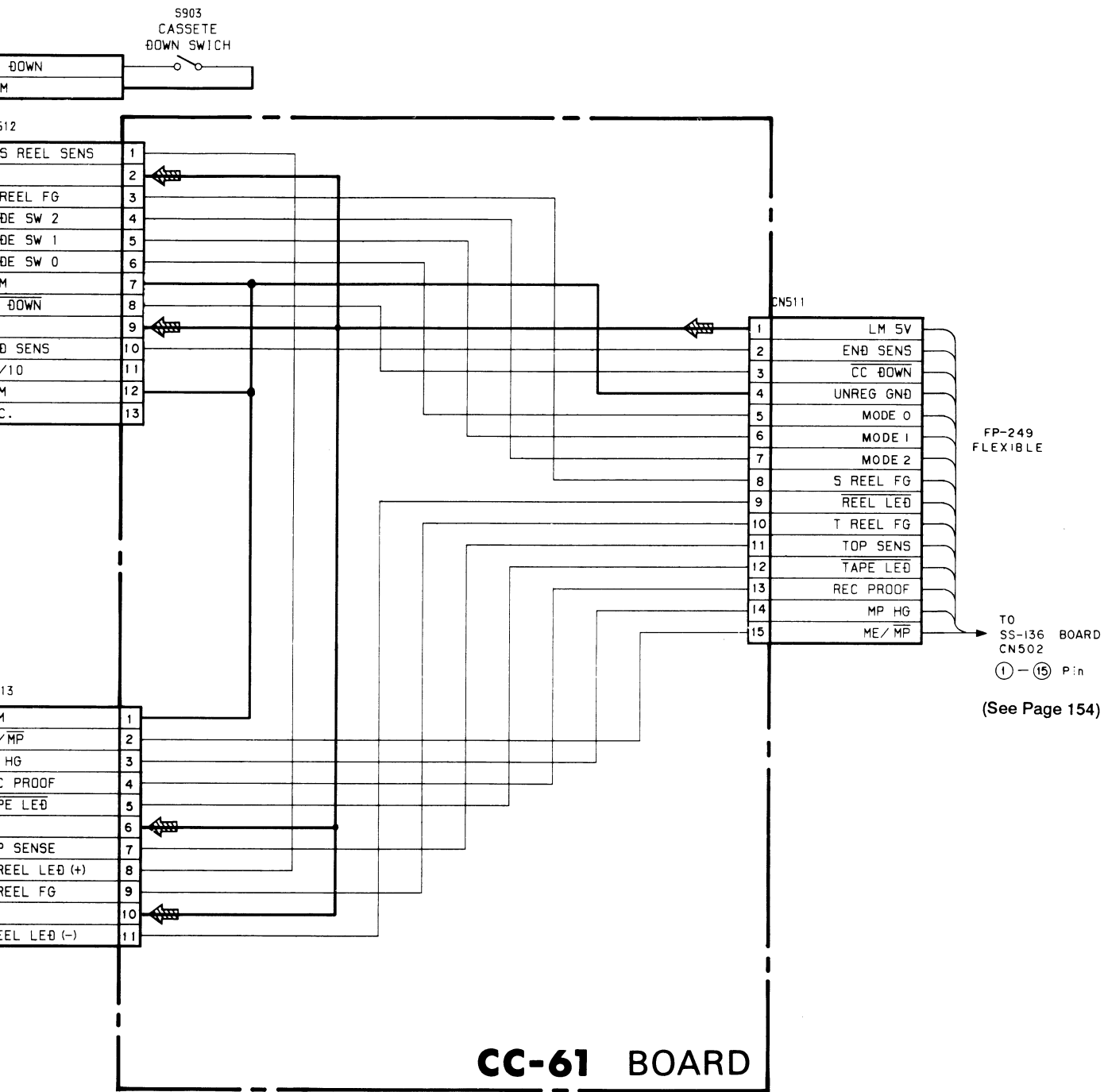


FP-249 FLEXIBLE

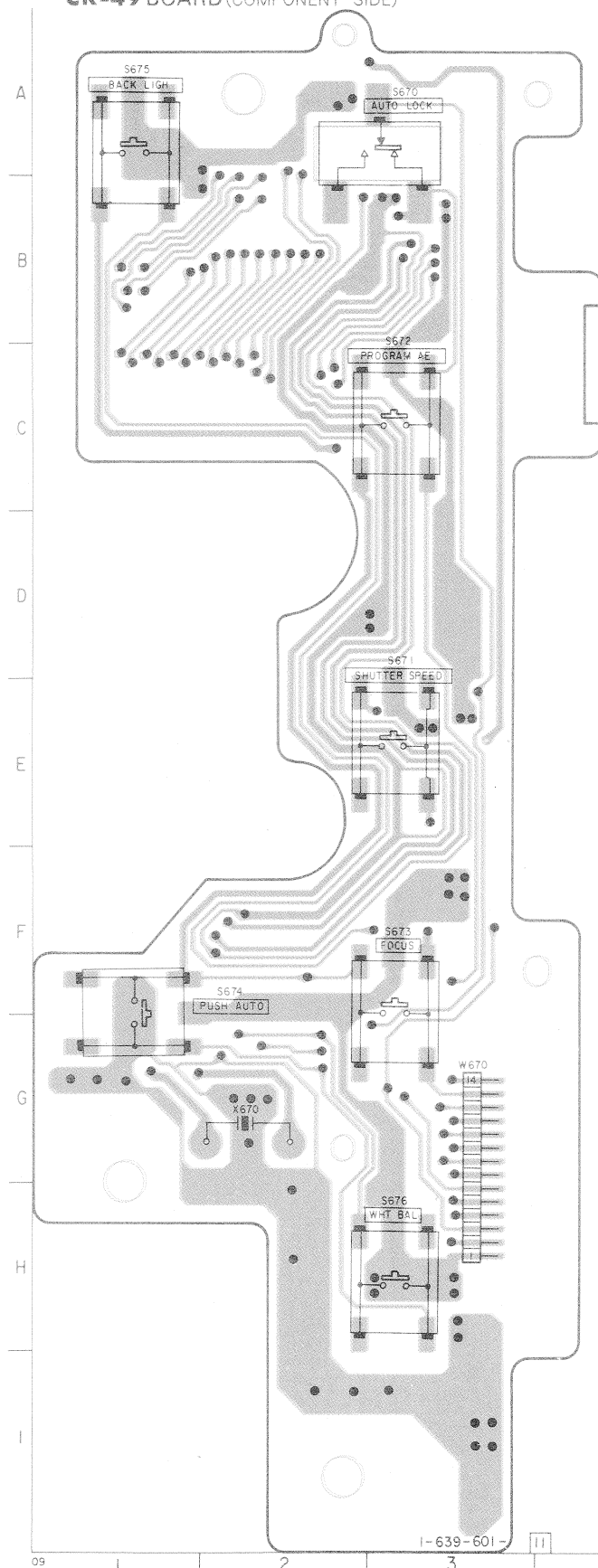
TO SS-136 BOARD CN502 ①-⑮ Pin

(See Page 154)

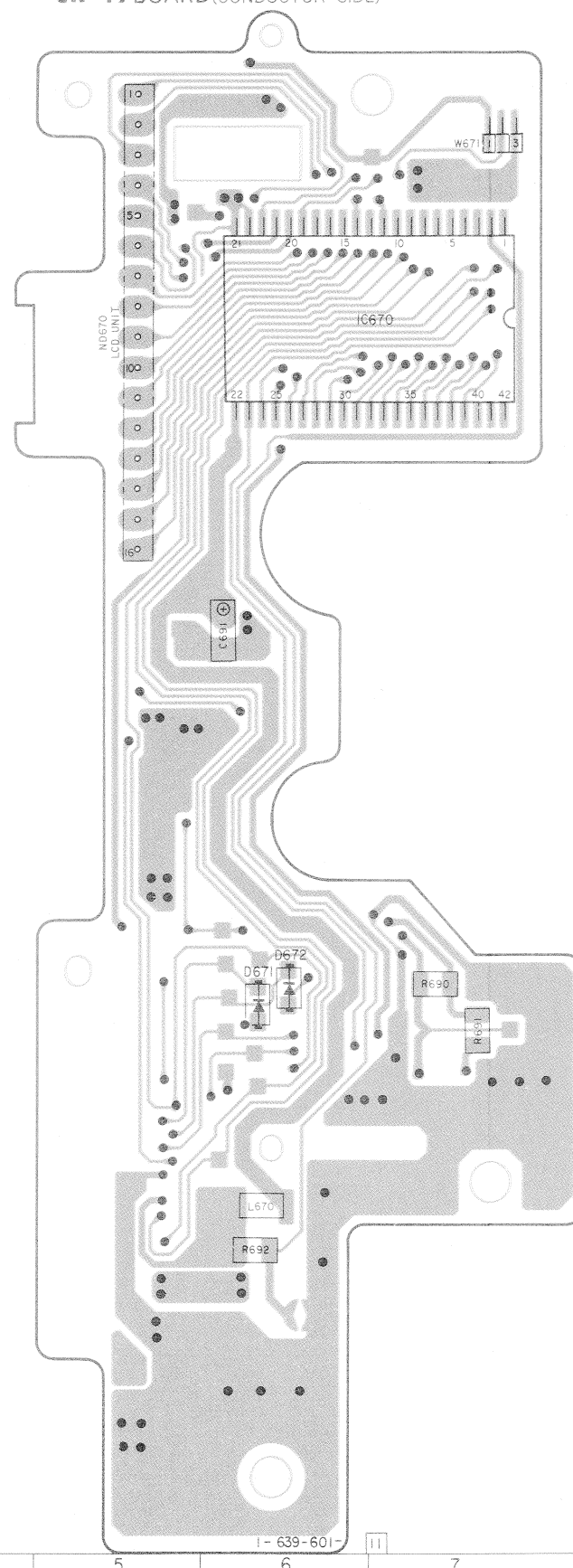
7	8	9	10	11	12	13	14	15
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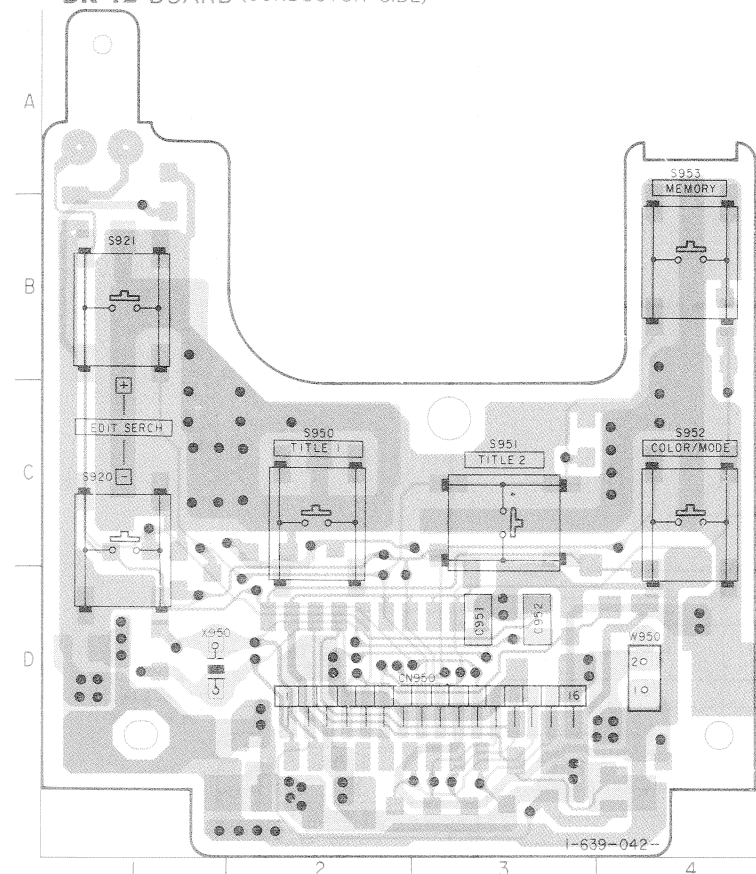
CK-49 BOARD (COMPONENT SIDE)



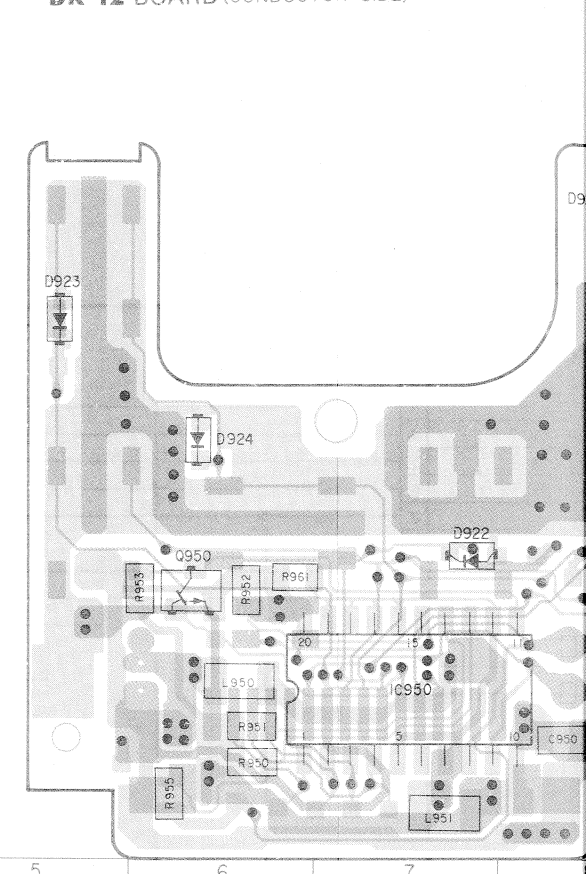
CK-49 BOARD (CONDUCTOR SIDE)



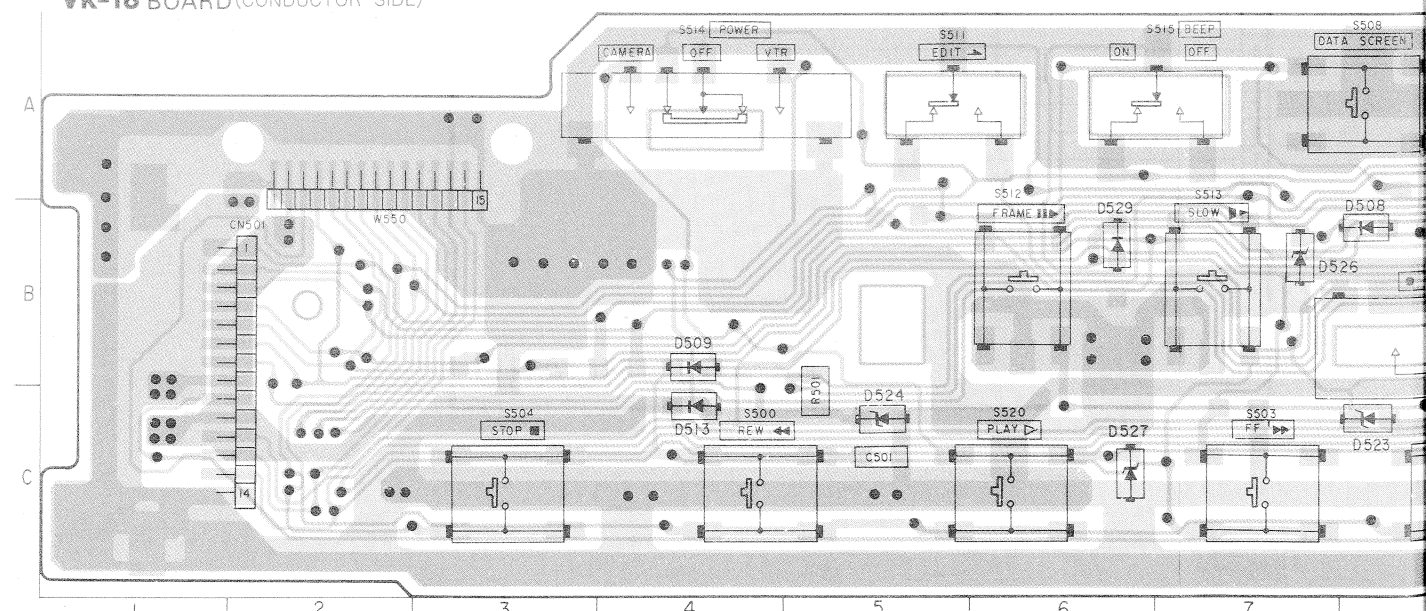
DK-12 BOARD (CONDUCTOR SIDE)



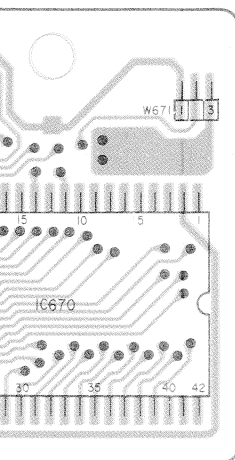
DK-12 BOARD (CONDUCTOR SIDE)



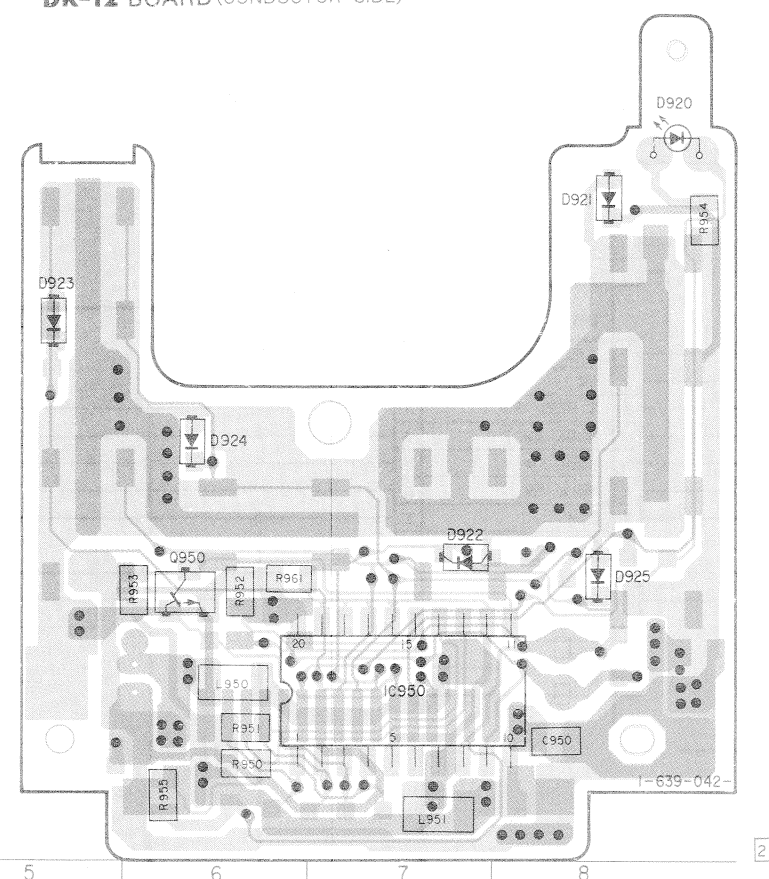
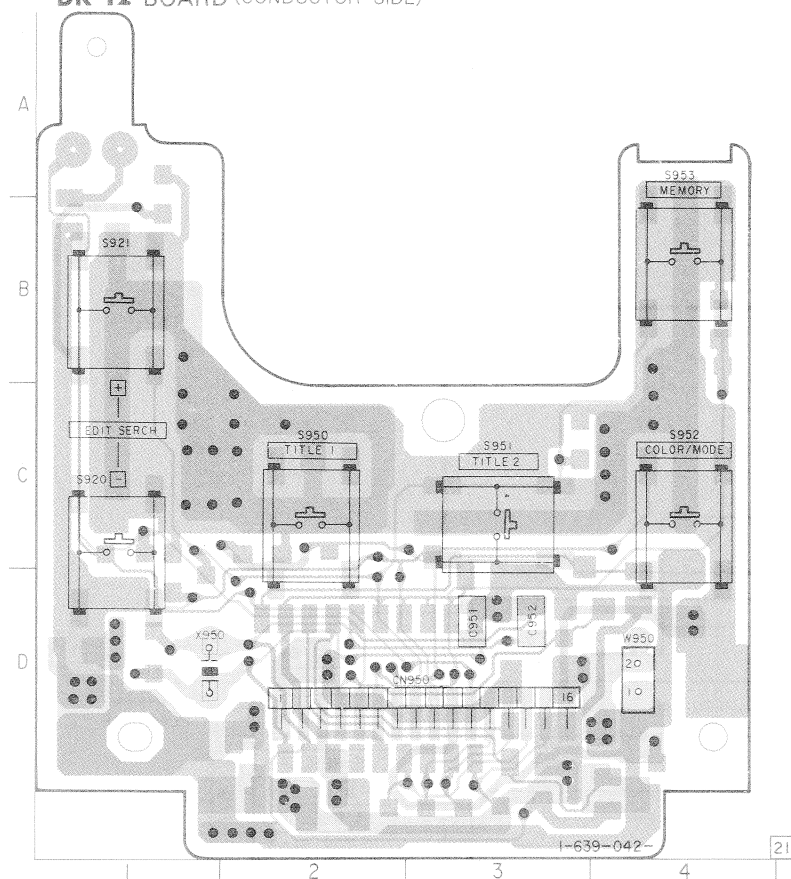
VK-16 BOARD (CONDUCTOR SIDE)



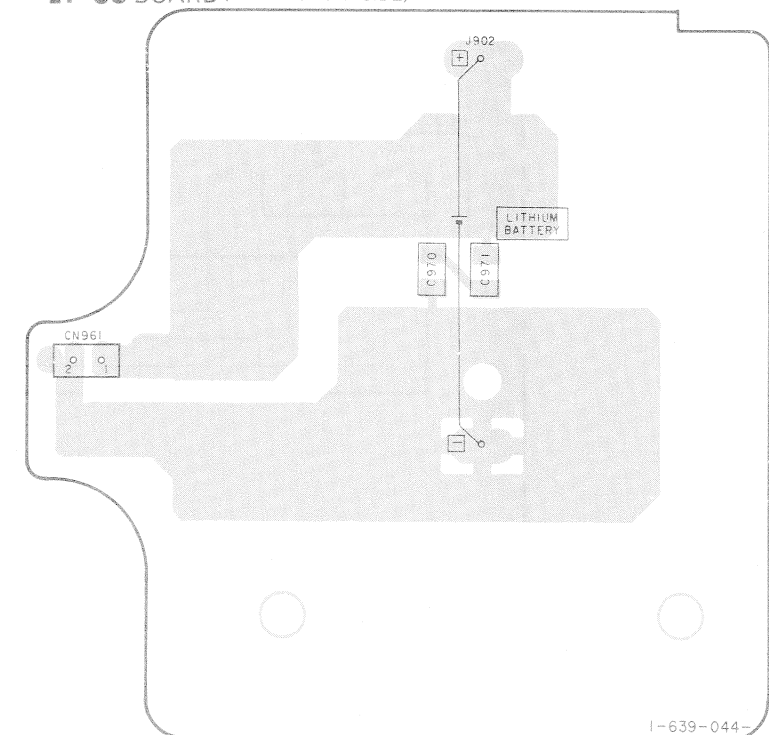
SIDE)



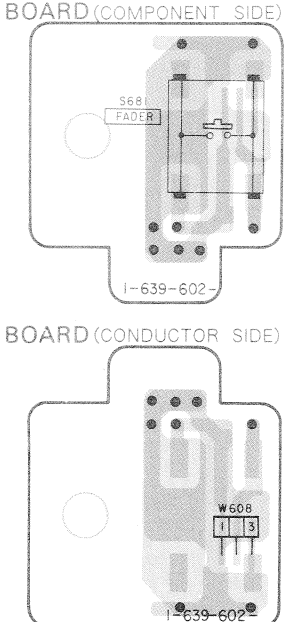
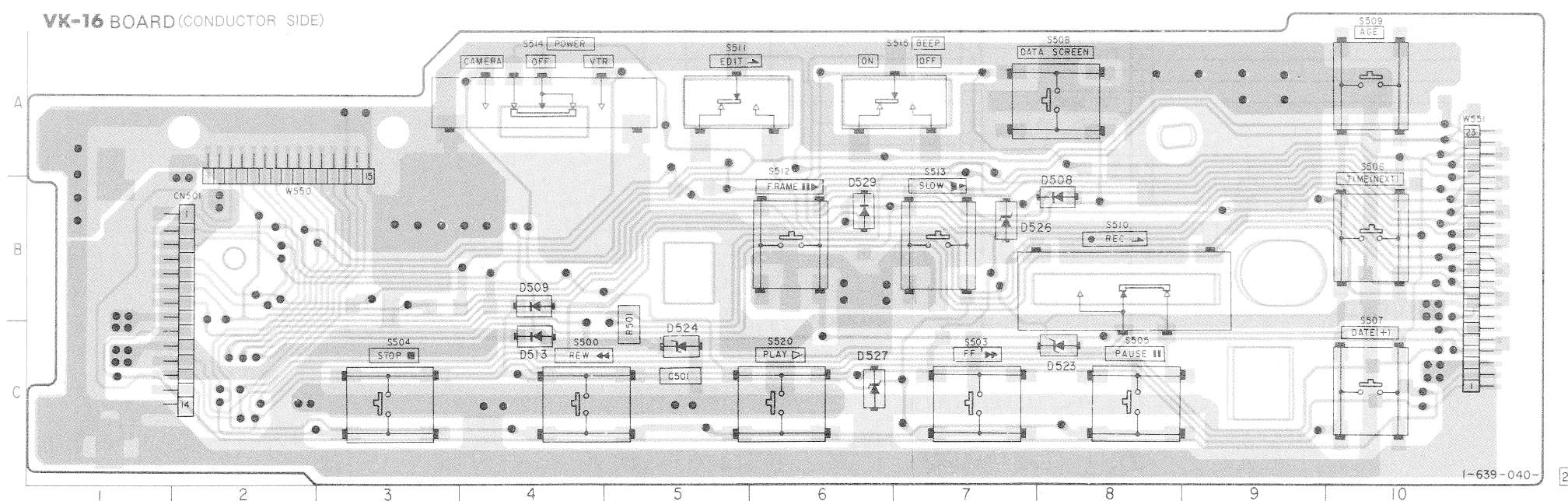
DK-12 BOARD (CONDUCTOR SIDE)



ZK-13 BOARD (COMPONENT SIDE)



ZK-13 BOARD (CONDUCTOR SIDE)



— Ref. No. VK-16 BOARD: 4000 series, DK-12 BOARD: 5000 series, CK-49 BOARD: 5000 series, LI-36 BOARD: 6000 series, ZK-13 BOARD: 5000 series —

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A-7071-406-A CK-49/ZK-13 MOUNT (Ref.No 5,000 Series)

< DIODE >

D671 8-719-404-46 DIODE MA110
D672 8-719-404-46 DIODE MA110

< IC >

IC670 8-759-634-72 IC M34206M2-109FP

* A-7062-782-A DK-12P BOARD, COMPLETE

(Ref.No 5,000 Series)

< DIODE >

D920 8-719-812-41 LED TLR124, RED
D921 8-719-404-46 DIODE MA110
D922 8-719-159-30 DIODE RD8.2SB
D923 8-719-159-30 DIODE RD8.2SB
D924 8-719-159-30 DIODE RD8.2SB

< IC >

IC950 8-759-145-63 IC uPD7564G-540-E1

< TRANSISTOR >

Q950 8-729-901-01 TRANSISTOR DTC144EK

* A-7071-424-A VK-16P BOARD, COMPLETE (AEP/UK)

* A-7071-454-A VK-16PB BOARD, COMPLETE (AUS/E)

(Ref.No 4,000 Series)

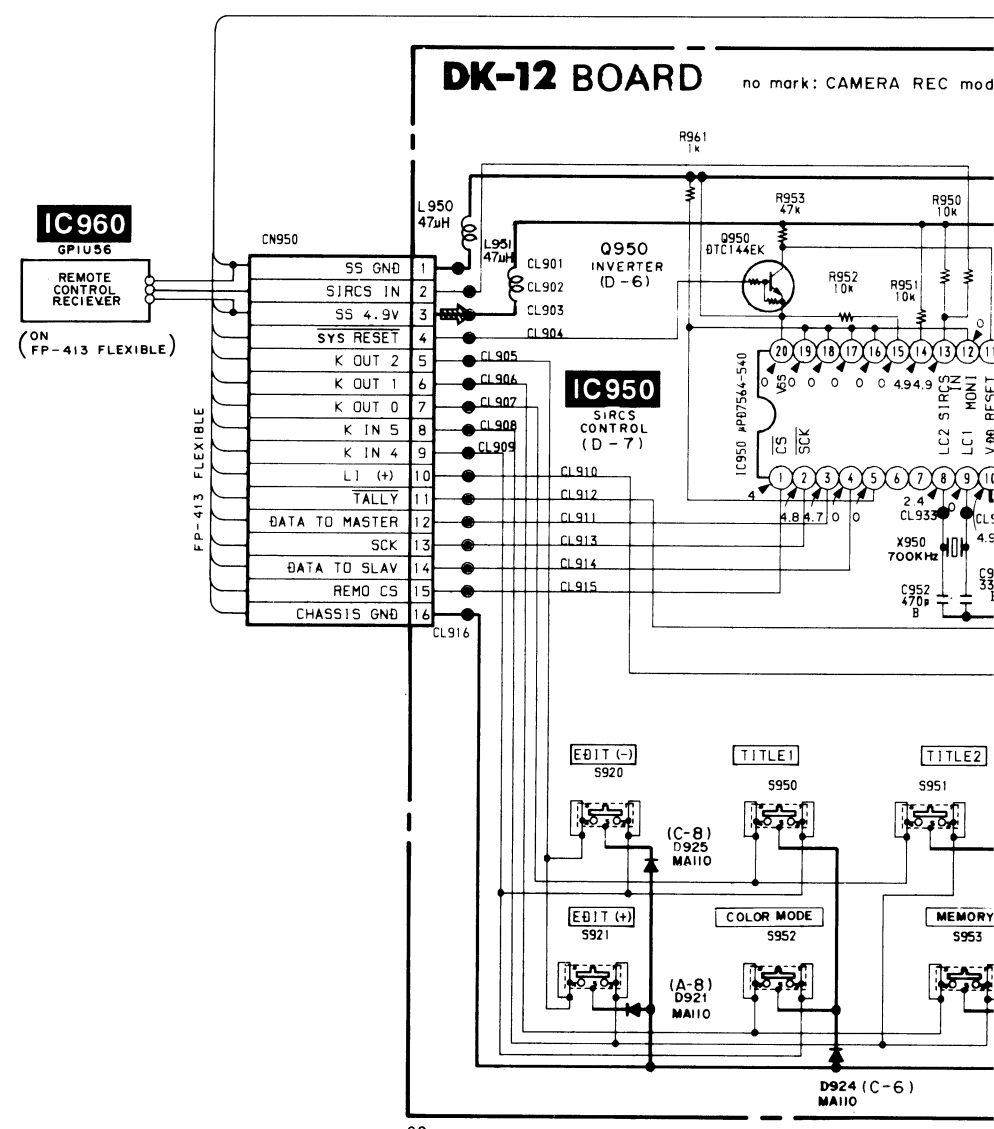
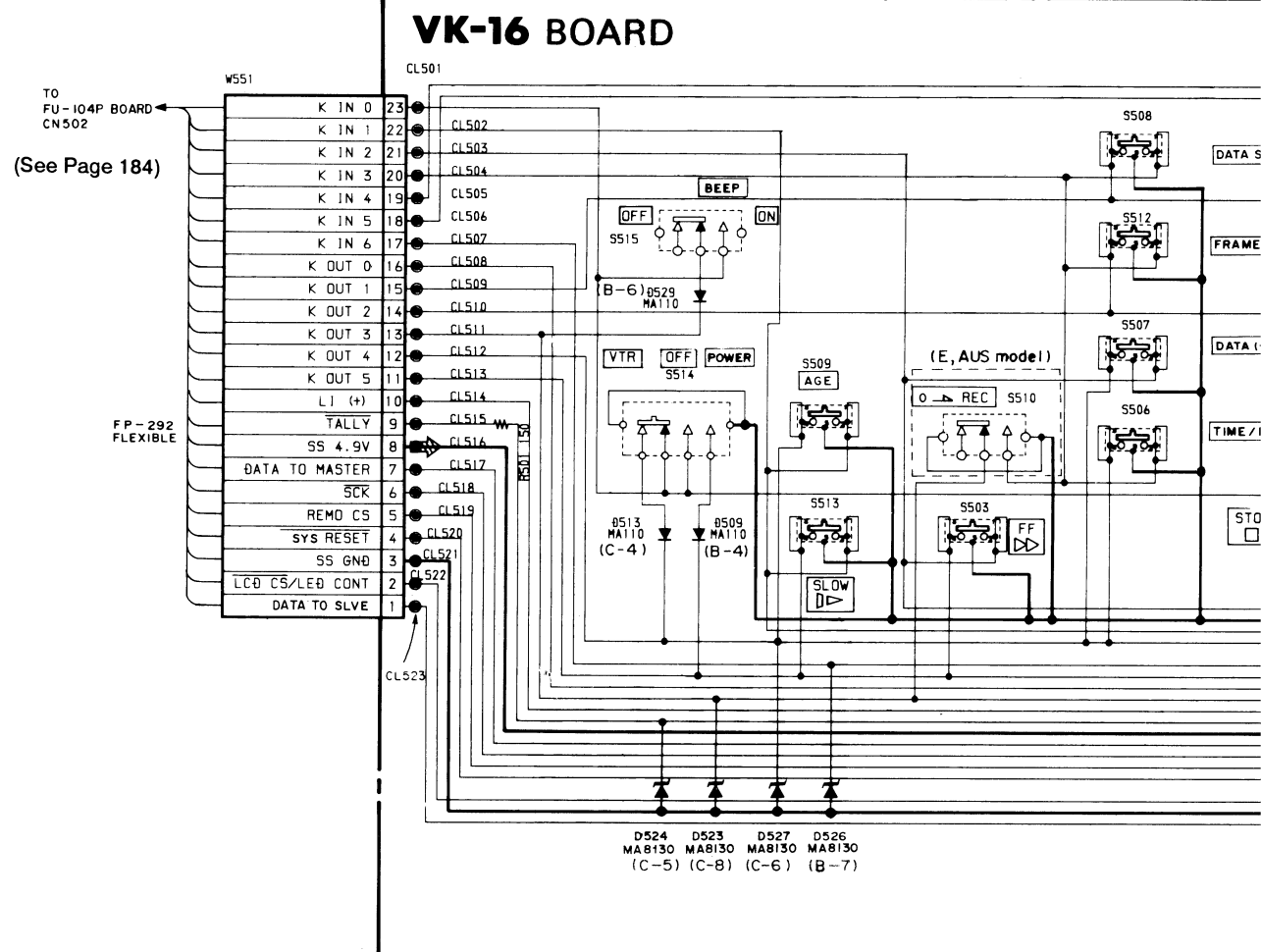
< DIODE >

D508 8-719-404-46 DIODE MA110
D509 8-719-404-46 DIODE MA110
D513 8-719-404-46 DIODE MA110
D523 8-719-161-02 DIODE RD8.210SB
D524 8-719-161-02 DIODE RD8.210SB

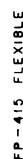
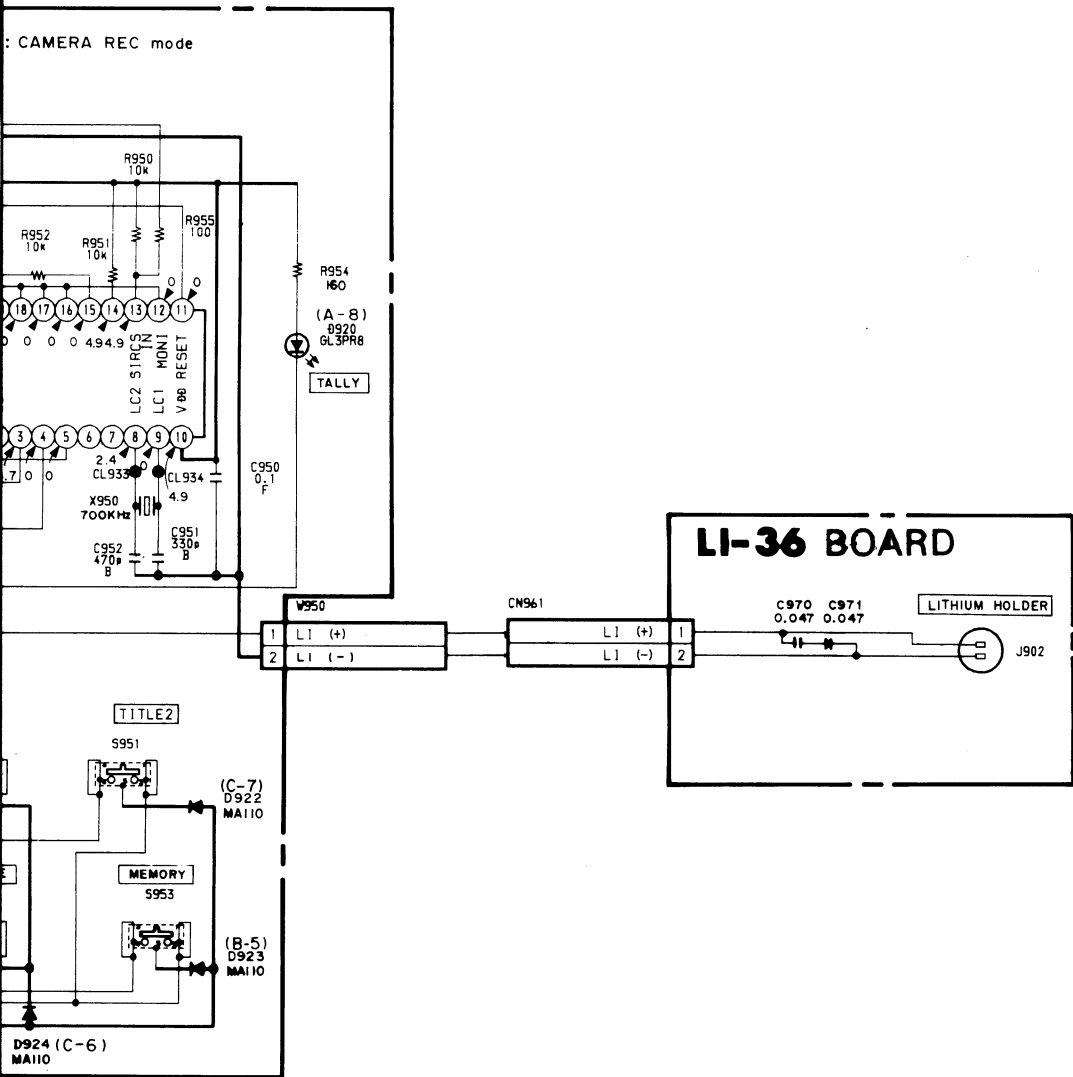
D526 8-719-161-02 DIODE RD8.210SB
D527 8-719-161-02 DIODE RD8.210SB
D529 8-719-404-46 DIODE MA110

< IC >

IC960 8-749-921-76 IC GP1U56 (ON FP-413 FLEXIBLE)



: CAMERA REC mode



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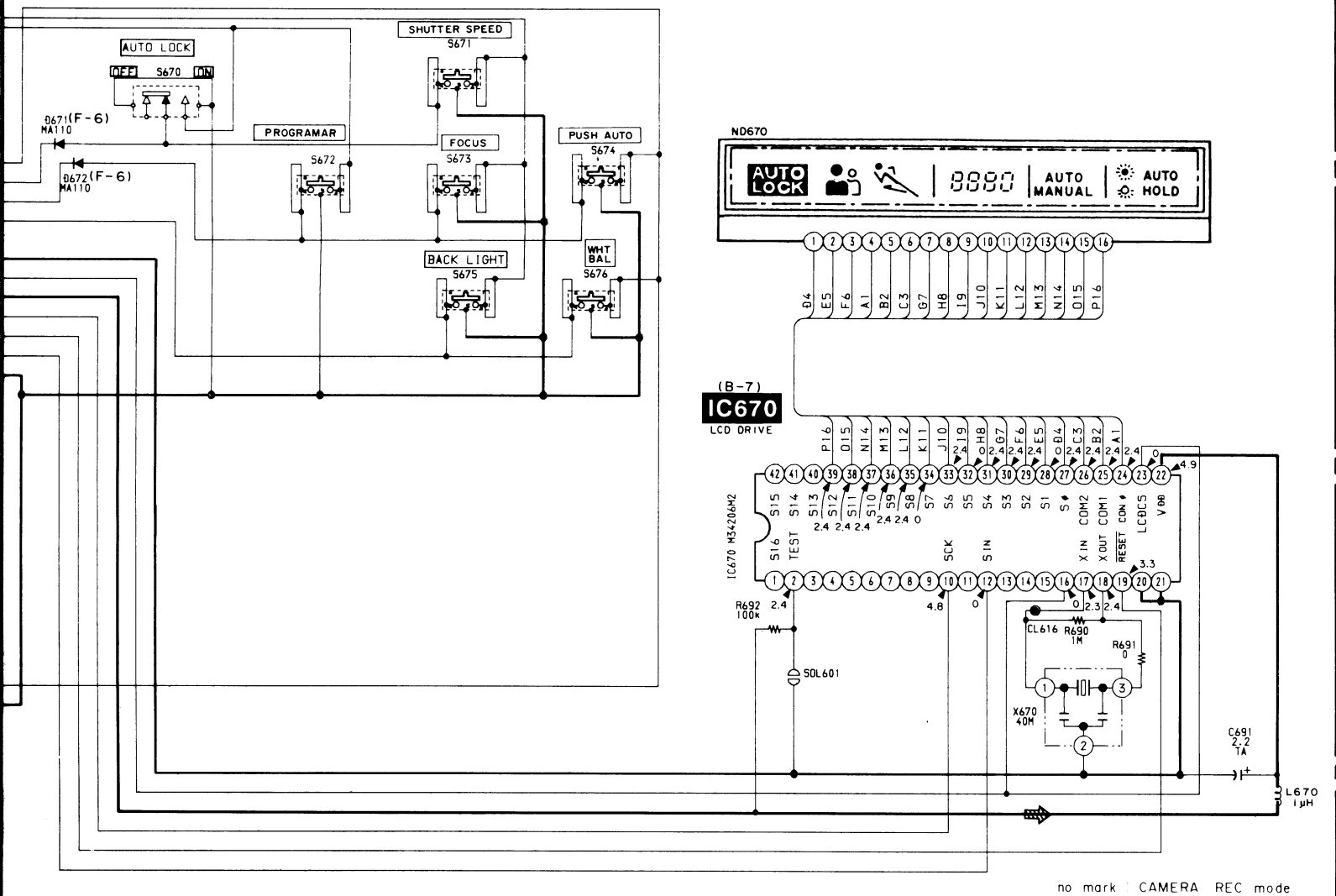
24

25

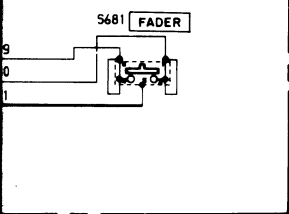
26

27

19 BOARD



13 BOARD



VF-26 (VIEW FINDER), VF-27 (VIEW FINDER) PRINTED WIRING BOARD
— Ref. No. VF-26 BOARD: TYPE 1 7000 series, TYPE 2 8000 series, VF-27 BOARD: TYPE 1 7000 series, TYPE 2 8000 series

* A-7062-278-A VF-26P BOARD, COMPLETE (TYPE 1)

(Ref. No 7, 000 Series)

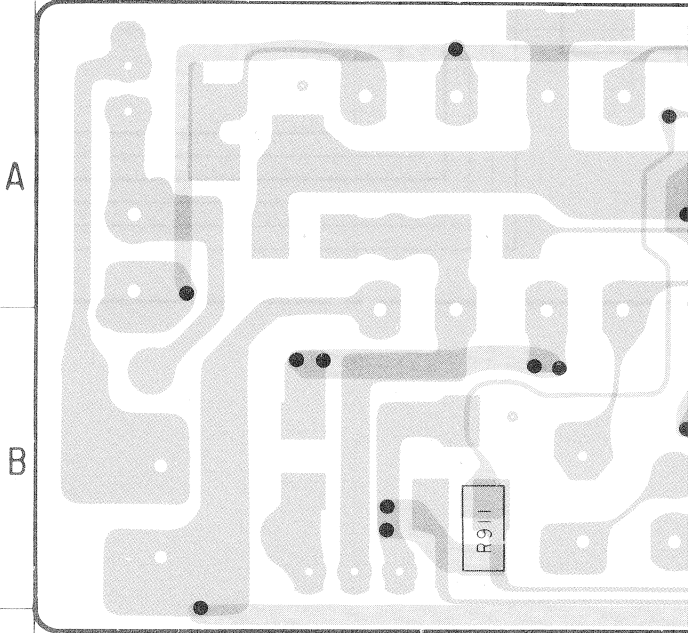
< DIODE >			
D670	8-719-404-46	DIODE	MA110
D903	8-719-400-20	DIODE	MA152WA
D955	8-719-404-19	DIODE	LN1251C
< IC >			
IC901	8-759-420-01	IC	AN2512S
< TRANSISTOR >			
Q903	8-729-106-68	TRANSISTOR	2SD1615A
Q904	8-729-216-31	TRANSISTOR	2SA1163G

* A-7062-278-A VF-26P BOARD, COMPLETE (TYPE 2)

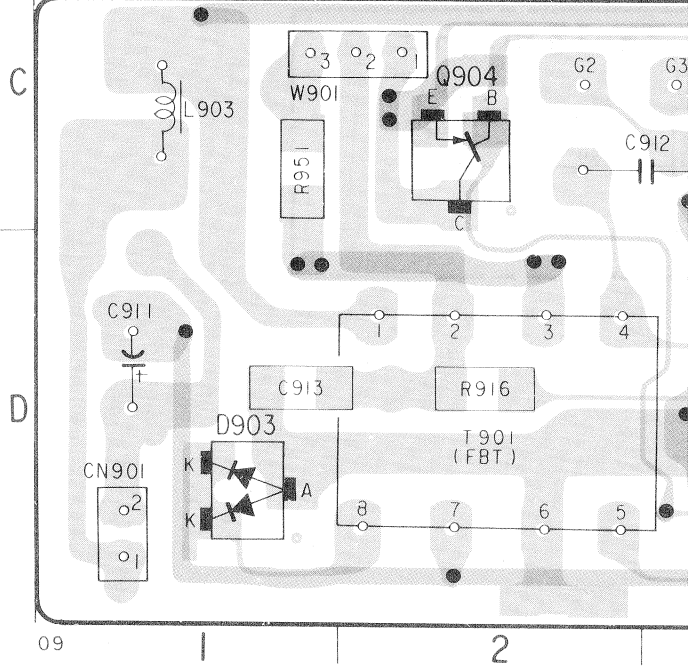
(Ref. No 8, 000 Series)

< DIODE >			
D670	8-719-404-46	DIODE	MA110
D903	8-719-400-20	DIODE	MA152WA
D955	8-719-404-19	DIODE	LN1251C
< IC >			
IC901	8-759-511-01	IC	BA7147F
IC901	8-759-514-91	IC	XRA7147F
< TRANSISTOR >			
Q903	8-729-106-68	TRANSISTOR	2SD1615A
Q903	8-729-420-81	TRANSISTOR	2SD874A
Q903	8-729-420-84	TRANSISTOR	2SD874A
Q904	8-729-216-31	TRANSISTOR	2SA1163G
Q904	8-729-216-32	TRANSISTOR	2SA1163L

VF-26 BOARD (COMPONENT SIDE)



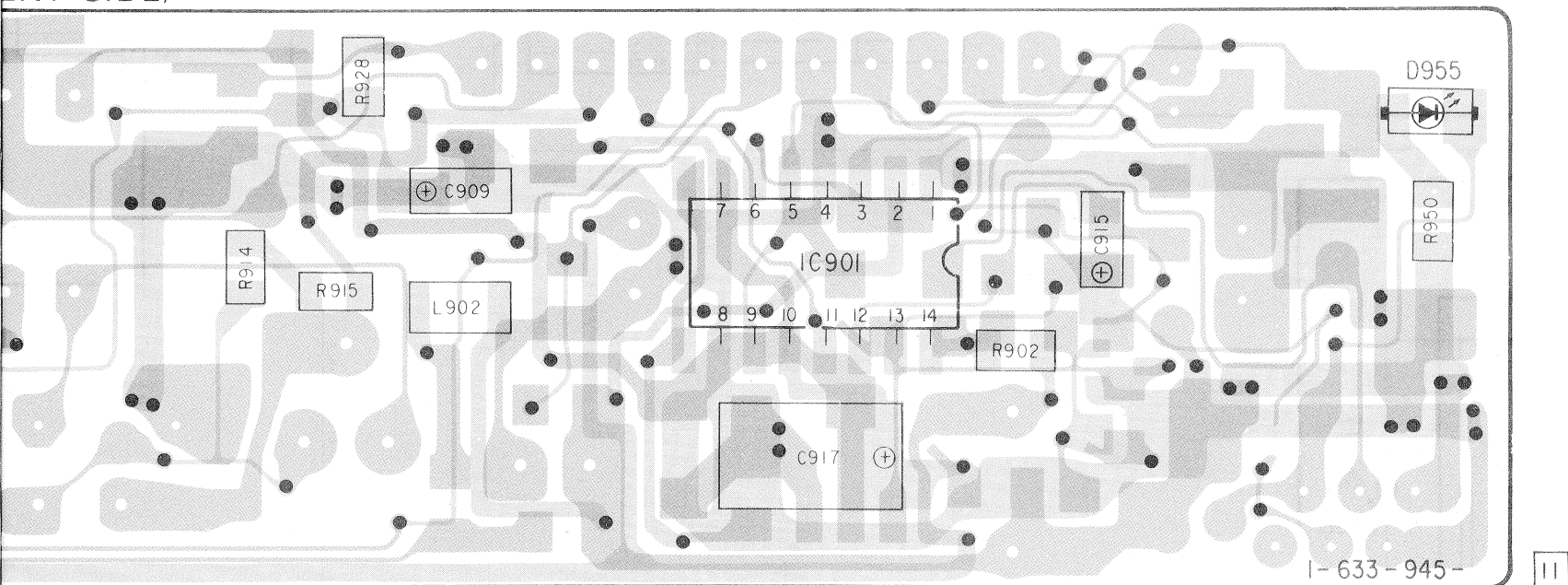
VF-26 BOARD (CONDUCTOR SIDE)



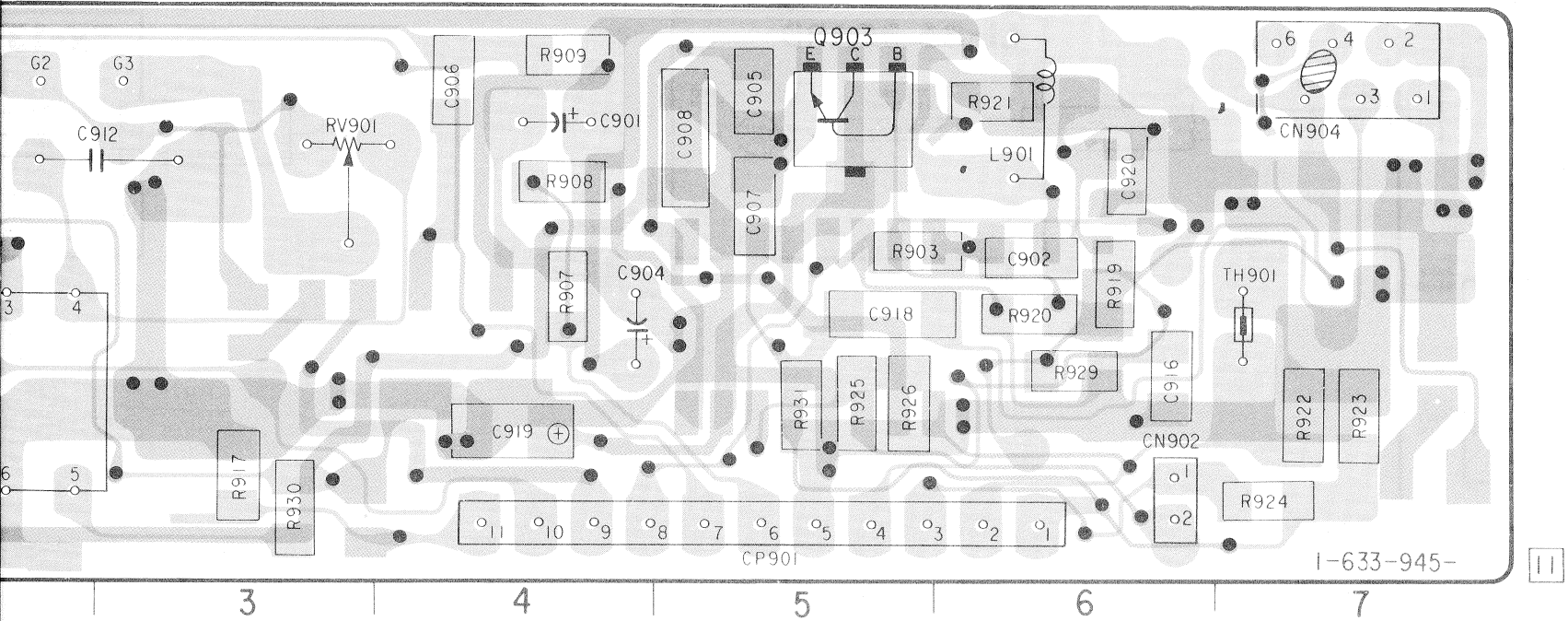
PRINTED WIRING BOARDS

es, VF-27 BOARD: 9000 series —

ENT SIDE)



OR SIDE)

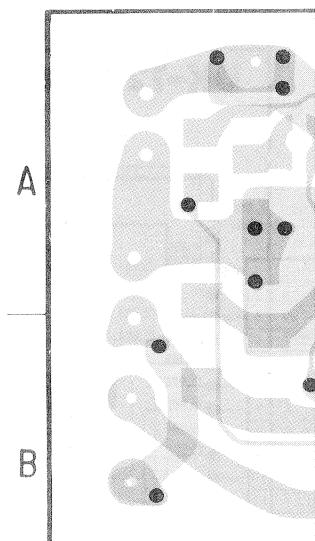


* A-7062-278-A VF-27P BOARD

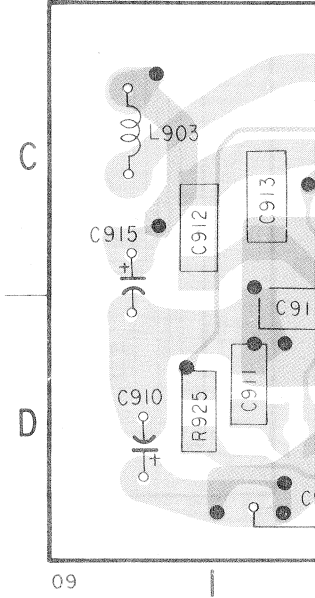
D903 8-719-400-20 D10
D955 8-719-404-19 D10

IC901 8-759-420-01 IC

VF-27 BOARD



VF-27 BOARD



* A-7062-278-A VF-27P BOARD, COMPLETE

(Ref.No 9,000 Series)

< DIODE >

D903 8-719-400-20 DIODE MA152WA
D955 8-719-404-19 DIODE LN1251C

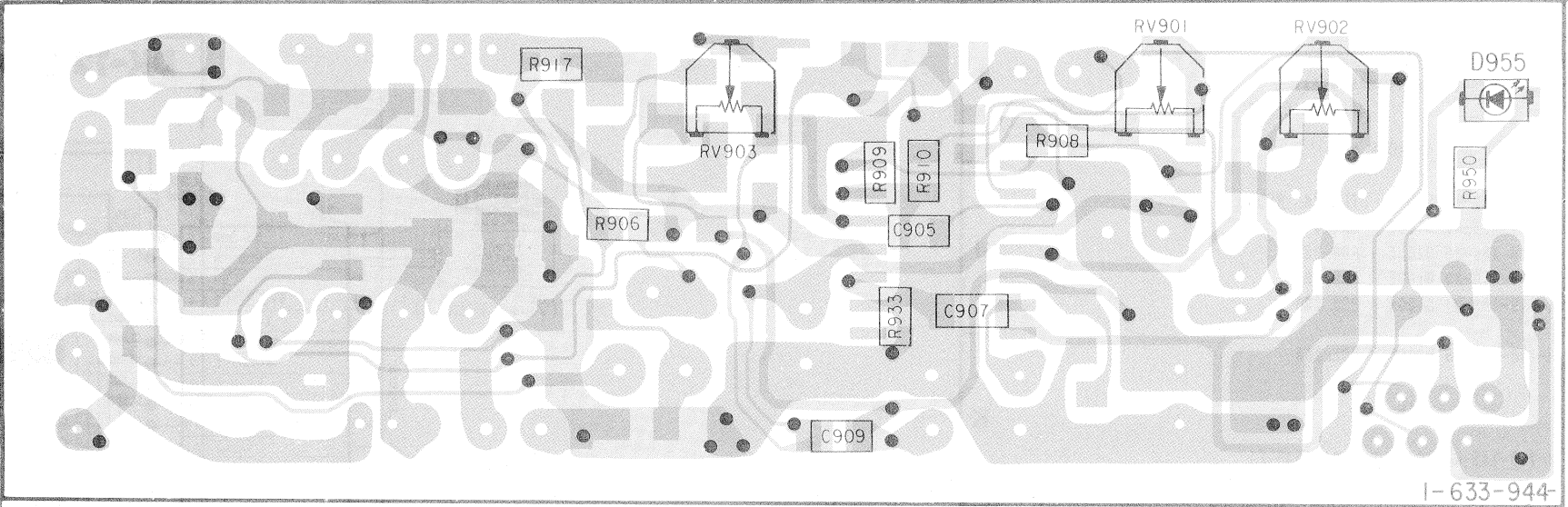
< TRANSISTOR >

Q903 8-729-216-31 TRANSISTOR 2SA1163G
Q904 8-729-100-66 TRANSISTOR 2SC1623
Q905 8-729-106-68 TRANSISTOR 2SD1615A

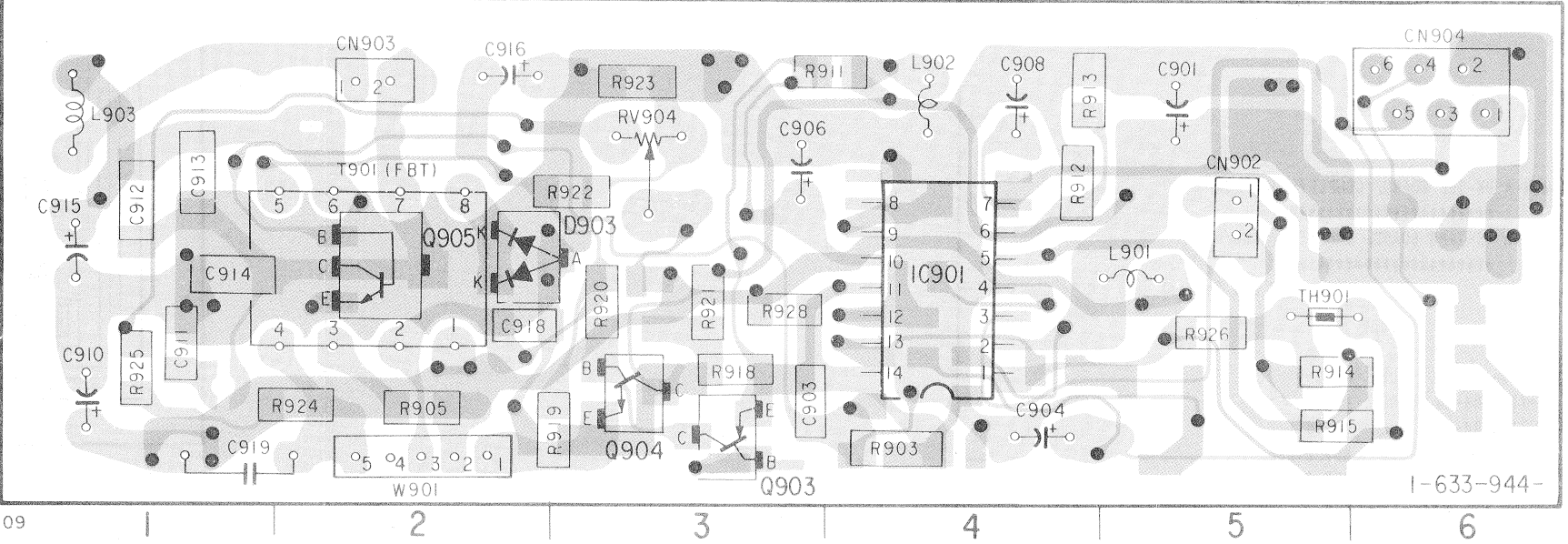
< IC >

IC901 8-759-420-01 IC AN2512S

VF-27 BOARD (COMPONENT SIDE)

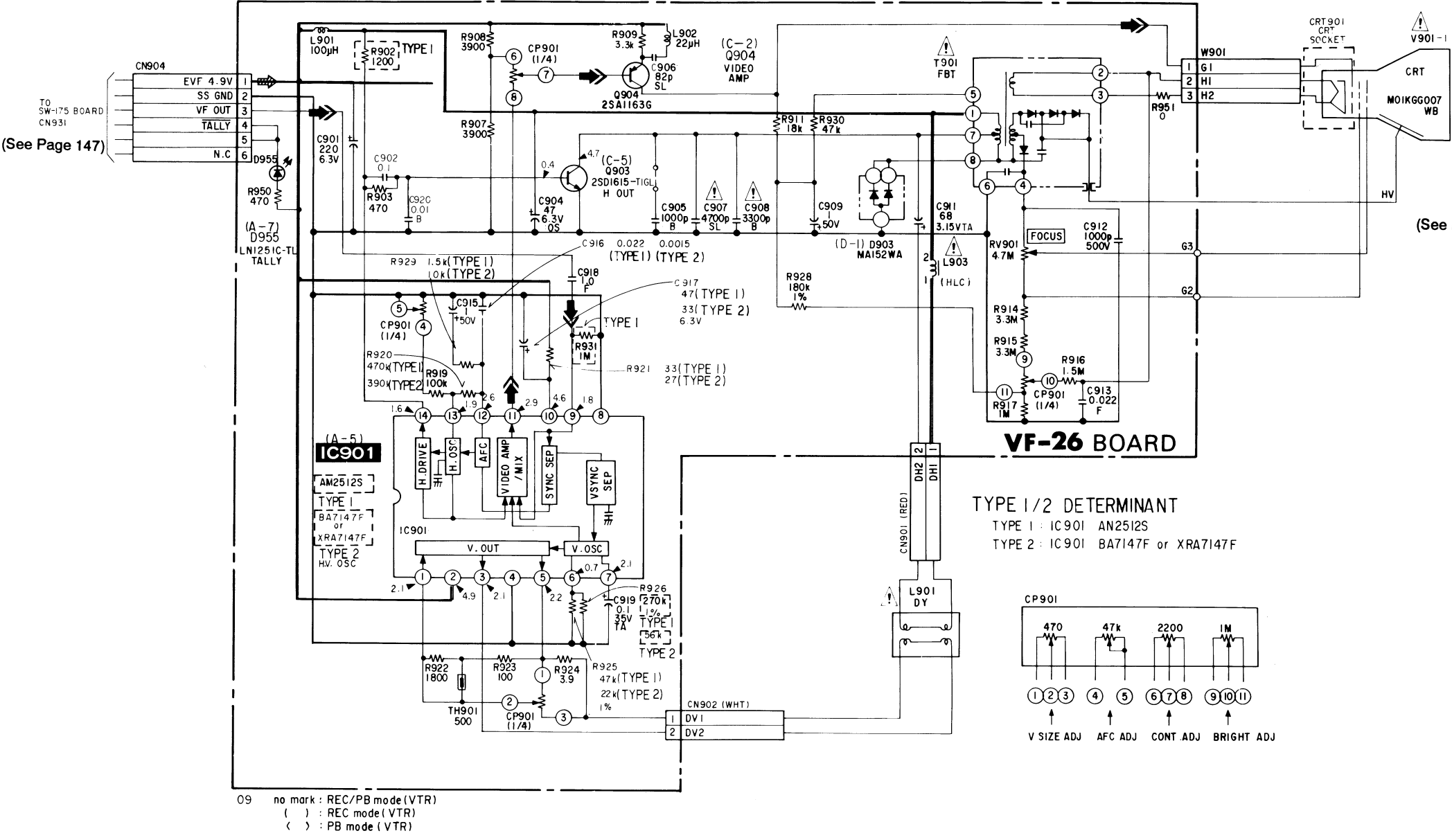


VF-27 BOARD (CONDUCTOR SIDE)

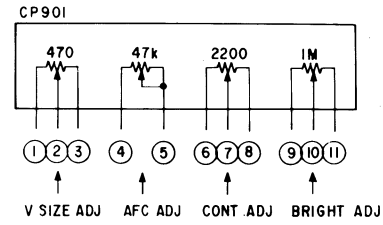


VF-26 (VIEW FINDER), VF-27 (VIEW FINDER) SCHEMATIC DIAGRAMS

— Ref. No. VF-26 BOARD: TYPE 1 7000 series, TYPE 2 8000 series, VF-27 BOAFD: 9000 series —

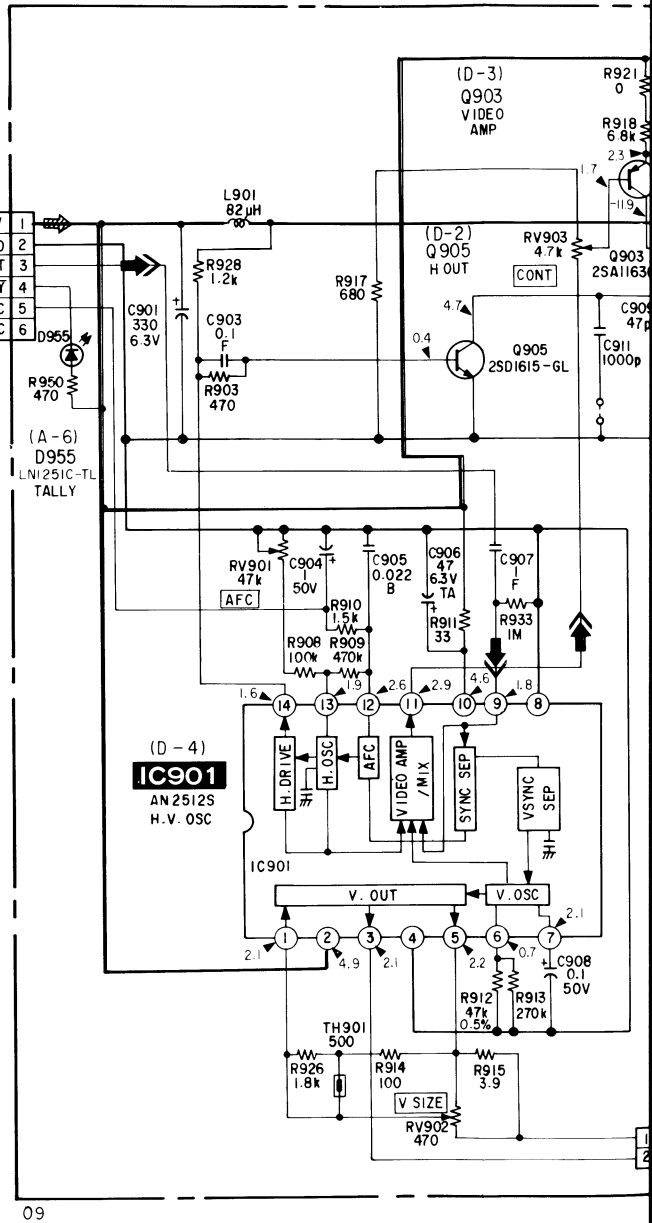


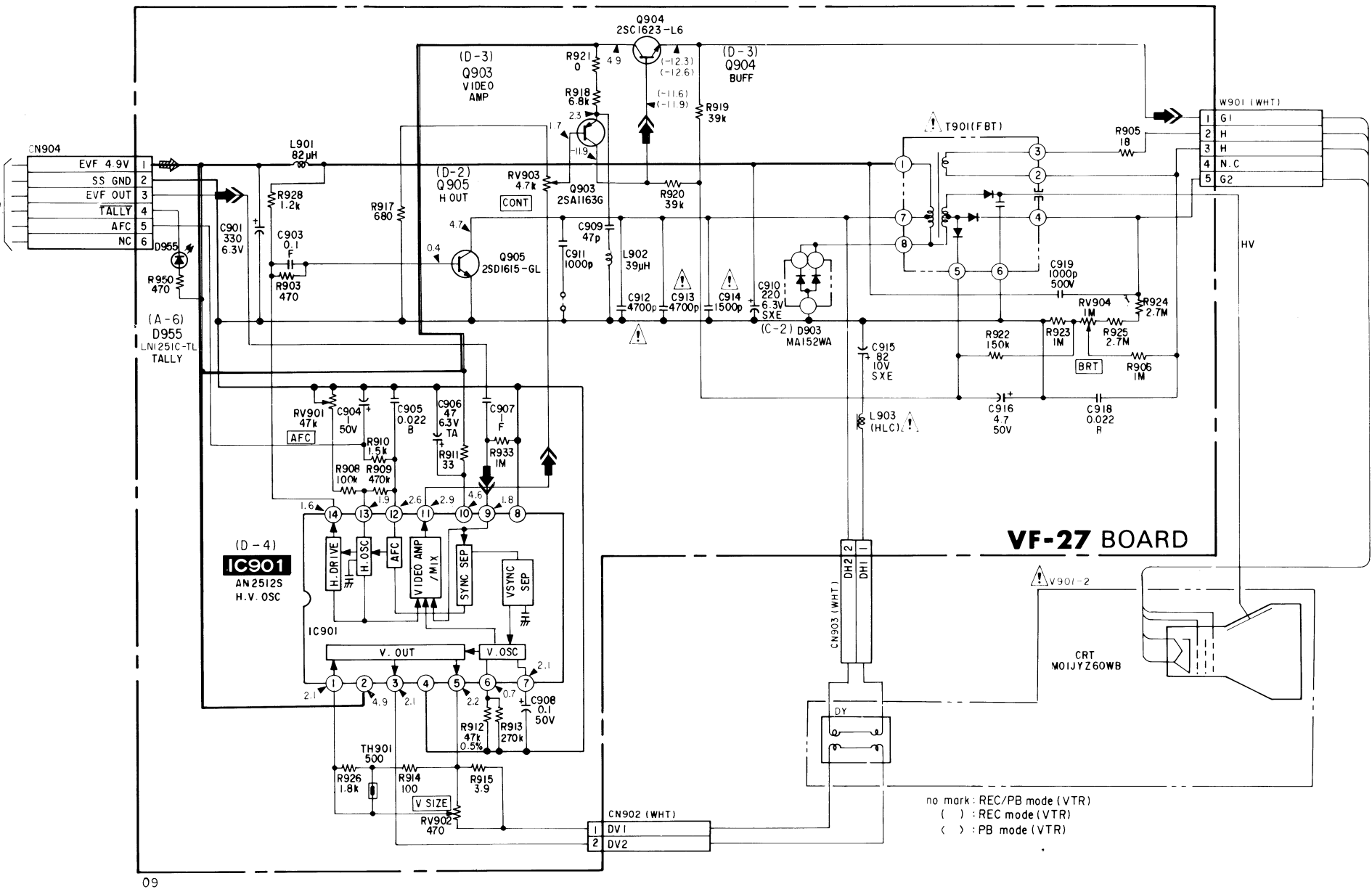
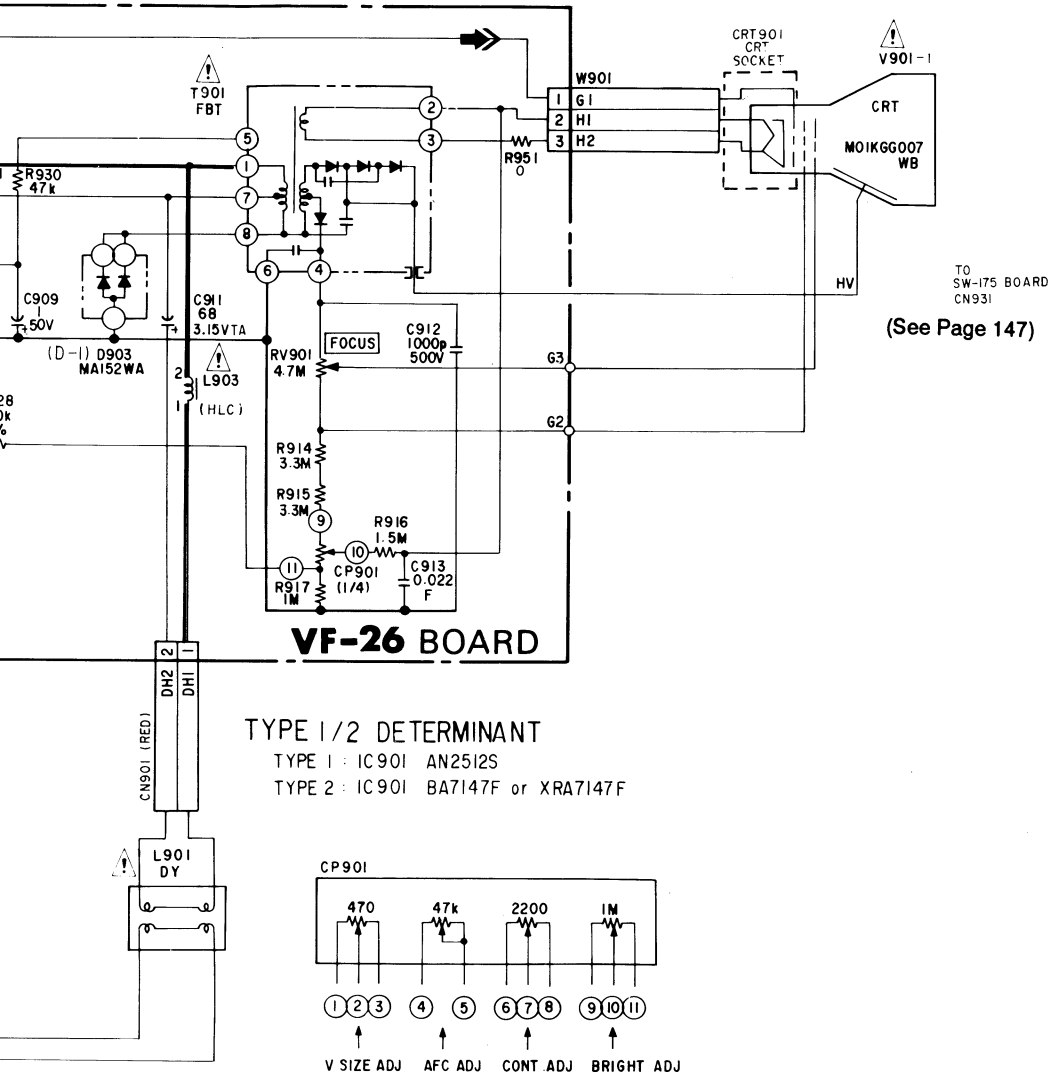
TYPE 1/2 DETERMINANT
TYPE 1: IC901 AN2512S
TYPE 2: IC901 BA7147F or XRA7147F



• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC		➡		
PB				





• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC		➡		
PB				

FU-104 (POWER), DC/DC CONVERTER BLOCK PRINTED WIRING BOARDS

— Ref. No. FU-104 BLOCK: 10000 series —

DC/DC CONVERTER board is replaced as a block, so that the PRINTED WIRING BOARD of it is or

FU-104 BOARD (COMPONENT SIDE)

* A-7062-781-A FU-104P BOARD, COMPLETE

(Ref. No 10,000 Series)

< DIODE >

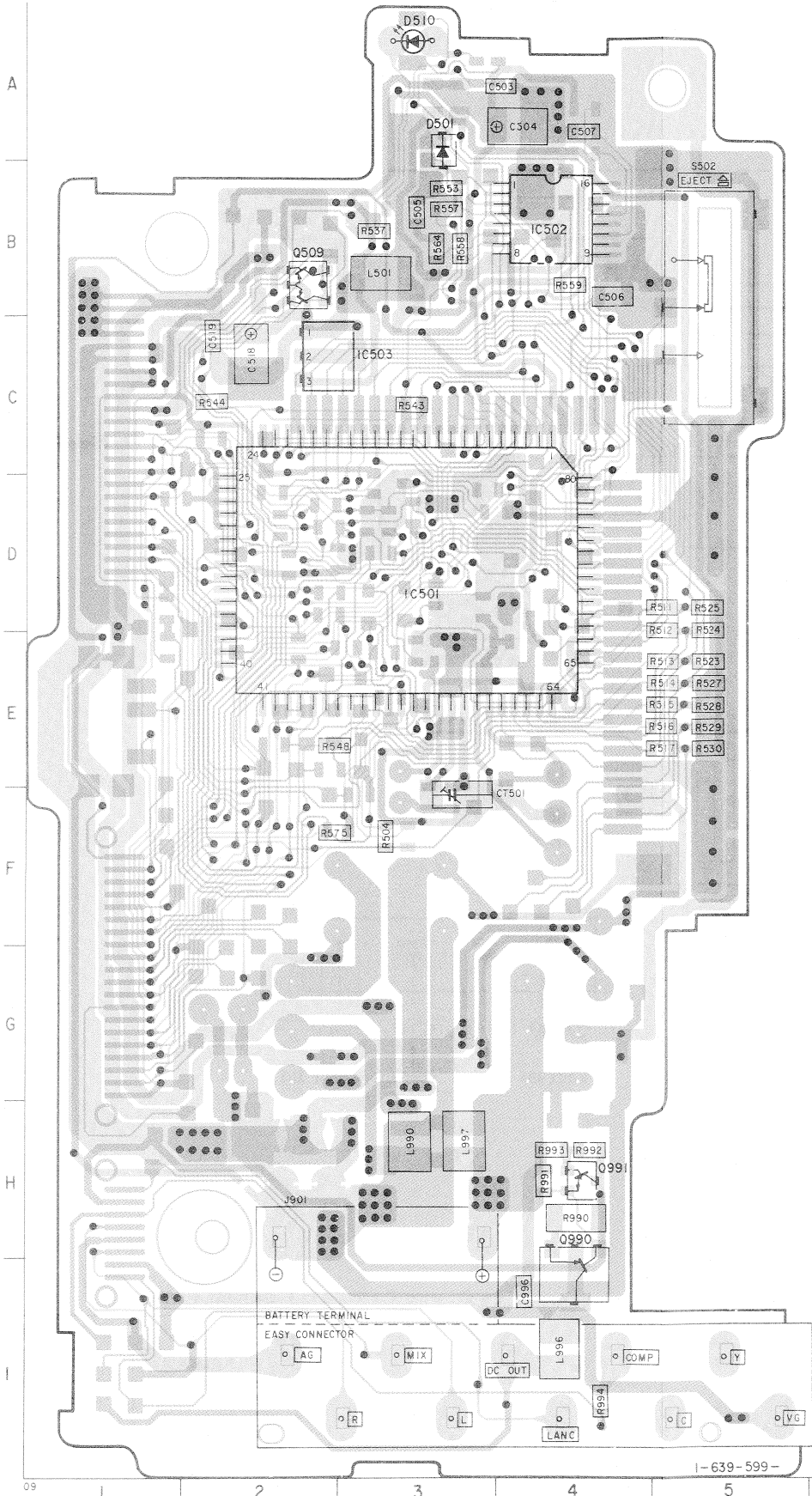
D501	8-719-421-27	DIODE	MA728
D503	8-719-404-46	DIODE	MA110
D504	8-719-404-46	DIODE	MA110
D505	8-719-404-46	DIODE	MA110
D506	8-719-404-46	DIODE	MA110
D507	8-719-404-46	DIODE	MA110
D510	8-719-812-41	LED	TLR124, RED
D510	8-719-940-99	DIODE	SLR-34VC3
D511	8-719-404-46	DIODE	MA110

< IC >

IC501	8-759-154-18	IC	uPD75316GF-116-389
IC502	8-759-511-22	IC	CXA1448N
IC503	8-759-937-54	IC	S-81250HG-RD

< TRANSISTOR >

Q509	8-729-904-20	TRANSISTOR	FMA2
Q579	8-729-905-12	TRANSISTOR	DTA144EU
Q990	8-729-101-07	TRANSISTOR	2SB798-DLCK
Q991	8-729-905-35	TRANSISTOR	2SC4081



— Ref. No. FU-104 BLOCK: 10000 series —

FU-104 BOARD (COMPONENT SIDE)

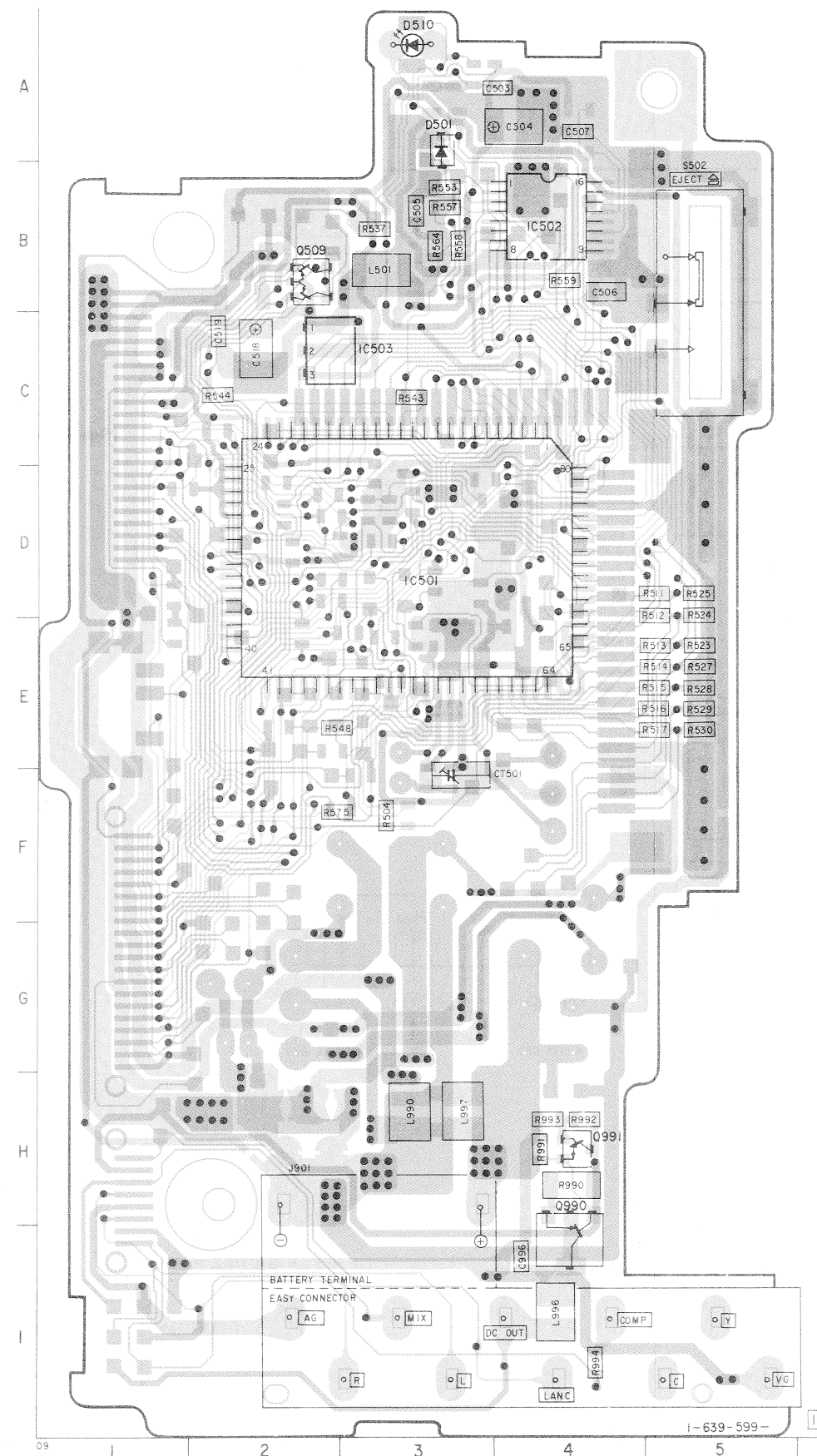
* A-7062-781-A FU-104P BOARD, COMPLETE

(Ref. No 10,000 Series)

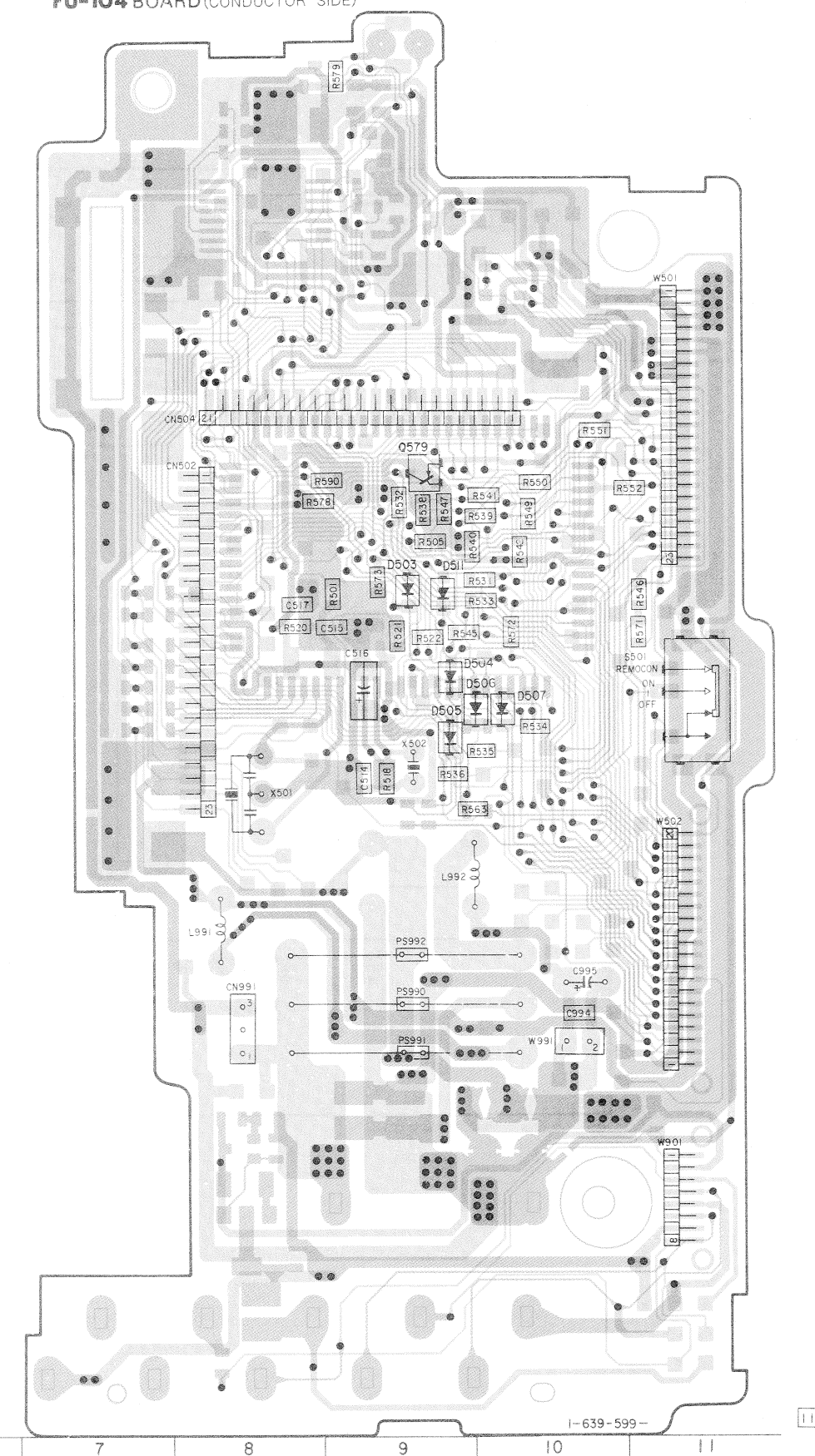
D501	8-719-421-27	DIODE	MA728
D503	8-719-404-46	DIODE	MA110
D504	8-719-404-46	DIODE	MA110
D505	8-719-404-46	DIODE	MA110
D506	8-719-404-46	DIODE	MA110
D507	8-719-404-46	DIODE	MA110
D510	8-719-812-41	LED	TLR124, RED
D510	8-719-940-99	DIODE	SLR-34VC3
D511	8-719-404-46	DIODE	MA110

IC501	8-759-154-18	IC	uPD75316GF-116-3B9
IC502	8-759-511-22	IC	CXA1448N
IC503	8-759-937-54	IC	S-81250HG-RD

Q509	8-729-904-20	TRANSISTOR	FMA2
Q579	8-729-905-12	TRANSISTOR	DTA144EU
Q990	8-729-101-07	TRANSISTOR	2SB798-DLKD
Q991	8-729-905-35	TRANSISTOR	2SC4081



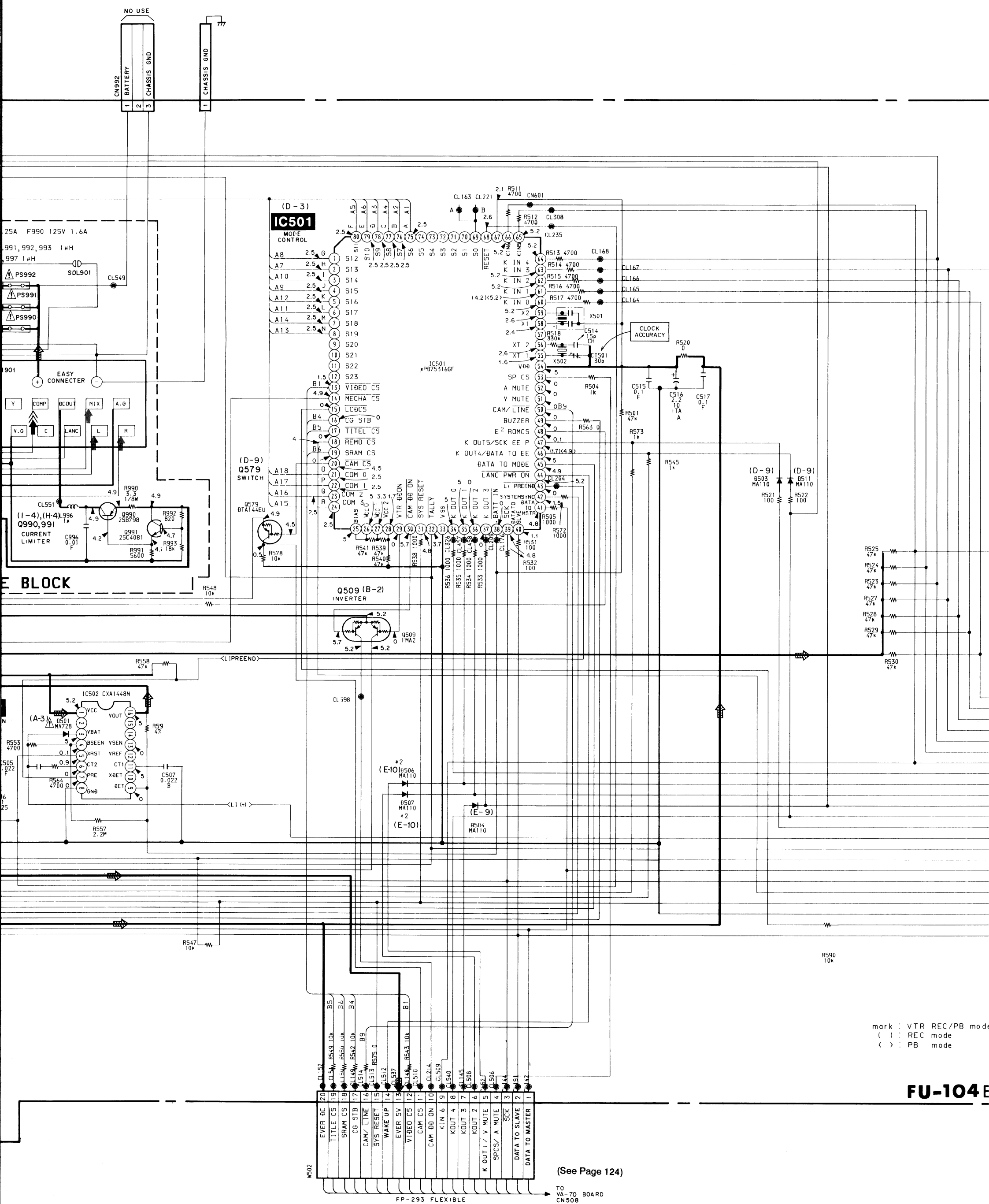
POWER POWER

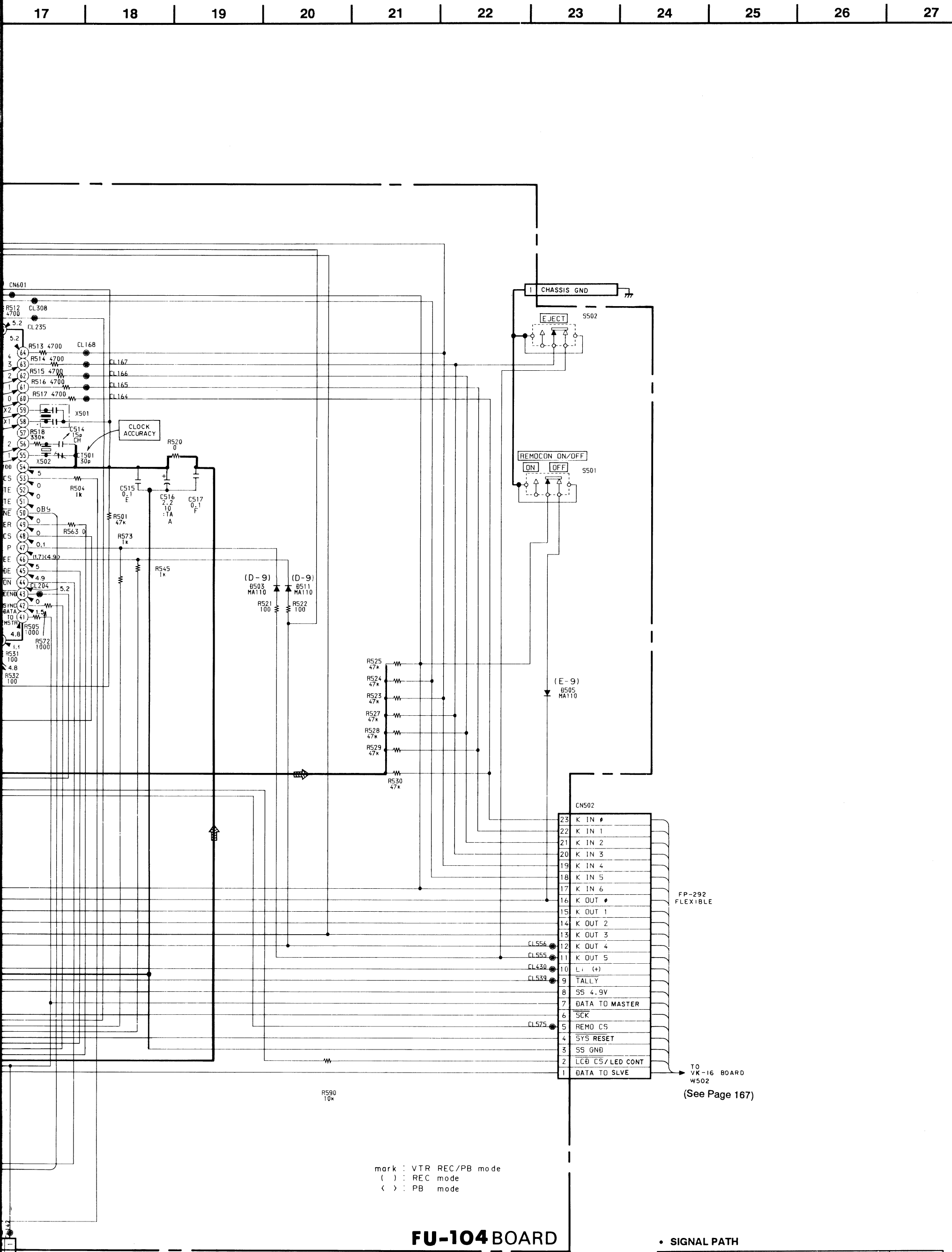


1	2	3	4	5	6	7	8	9	10	11
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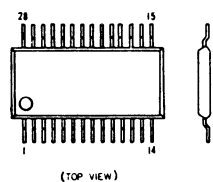


• SIGNAL PATH

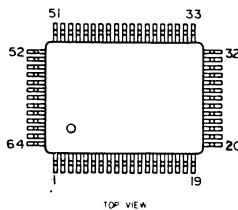
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA/DATA	
REC				
PB			⇒⇒⇒	⇒

4-3. SEMICONDUCTORS

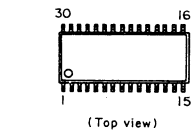
8464A-15LLPF



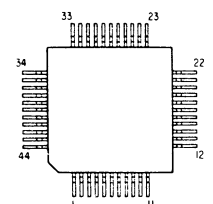
CF79028PG



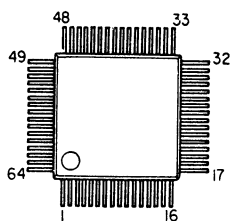
CXA1127M



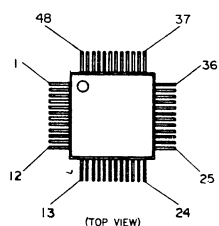
CXA1204Q
M51285BGP



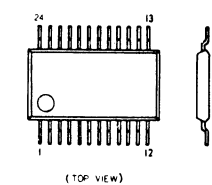
CXA1207R
MC68HC11E9FU



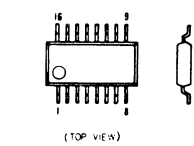
CXA1208R
CXA1392R
CXA1488R
MB673198U
MB8783PFV



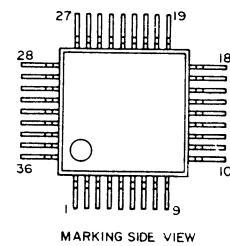
CXA1393AN



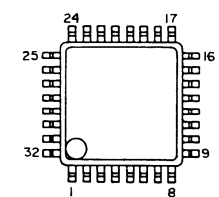
CXA1488R
CXL5502M
MC14094BPF



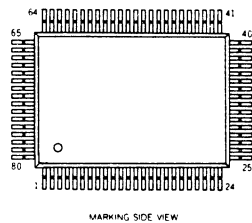
CXA1536Q



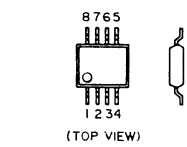
CXD1159Q



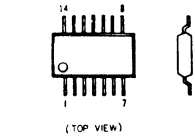
CXP80116
S-81250HG



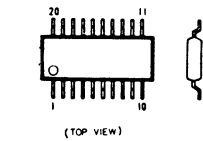
LA7293M
LM393DR
M5201FP
MM1036XF
NJM2233AM
NJM2234M
NJM2235M
RC3414M



LM324DR
TL1596CDB
XRU4066BF



M62352GP
UPD6451AGT
UPD7564G



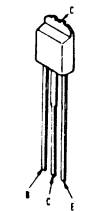
2SA1576S
2SB1218
2SB624
2SC2223
2SC4081R
2SD1819A
DTC115EU
DTC144EK
UN5213
UN5215



2SB1115A
2SB1121
2SB798



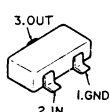
2SB1202FAT



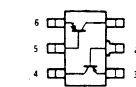
2SK94
2SK1332



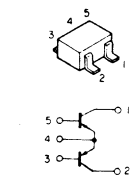
DTA144EU
DTC114EU
DTC114TU
DTC144EU
DTC144WU



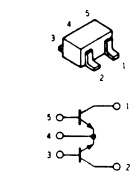
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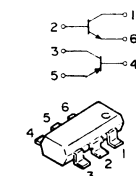
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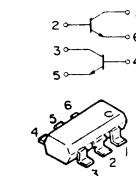
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FMG5



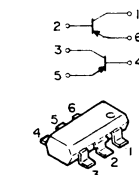
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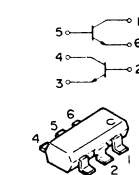
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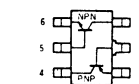
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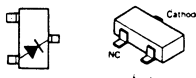
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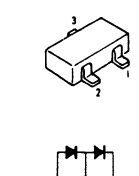
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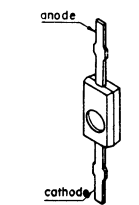
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1SS226



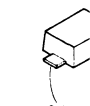
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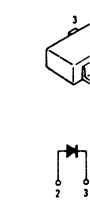
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DTZ5.1
MA728



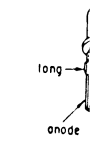
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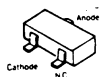
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SB05-05



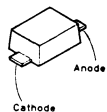
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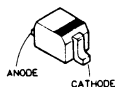
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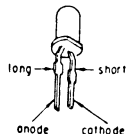
MA110



RD9.1M
SB05-05CP



TLR124



SECTION 5 EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.

- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE)...(RED)

Parts color Cabinet's color

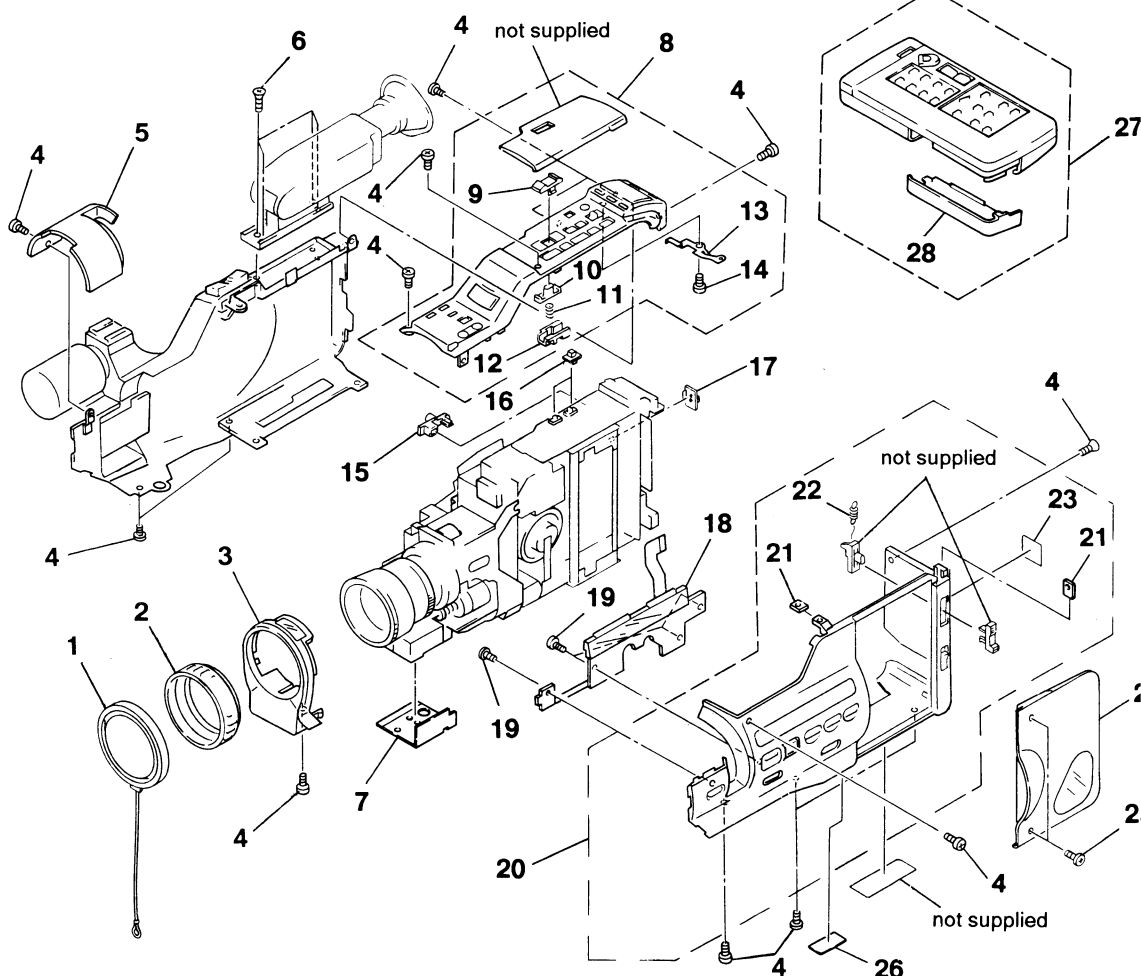
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- The mechanical parts with no reference number in the exploded views are not supplied.

- Hardware (# mark) list is given in the last of this parts list.

The components identified by a mark Δ or dotted line with Δ are critical for safety. Replace only with part number specified.

5-1. CABINET (R) AND CABINET (U) ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	A-7091-618-A	CAP BLOCK ASSY, HOOD	
2	3-728-269-01	HOOD	
3	X-3940-501-1	COVER ASSY, HEAD	
4	3-719-381-01	SCREW (M2X4)	
5	3-942-282-01	COVER, LENS	
6	3-719-831-21	SCREW (M2X4)	
7	3-943-337-01	COVER, AF	
8	X-3940-659-1	CABINET (UPPER) ASSY (AEP/UK)	
	X-3940-896-1	CABINET (UPPER) ASSY (E/Australian)	
9	3-744-723-01	BUTTON (10), POWER	
10	* 3-718-257-11	BUTTON, PUSH, POWER	
11	3-303-973-00	SPRING, COMPRESSION	
12	3-744-815-01	PLATE, BLIND, POWER	
13	3-942-242-01	SPRING, LEAF, CLICK	
14	3-713-790-01	SCREW (M2X5), TAPPING, P3	

Ref. No.	Part No.	Description	Remark
15	3-744-897-01	KNOB, BILINGUAL	
16	3-942-255-01	BUTTON, EDIT	
17	3-744-875-03	KNOB, REMOTE	
18	* A-7071-426-A	CK-ZK BOARD, COMPLETE	
19	3-713-790-21	SCREW (M2X6), TAPPING, P3	
20	X-3940-660-1	CABINET (R) ASSY	
21	3-718-233-01	NUT, PLATE	
22	3-674-402-00	SPRING, TENSION	
23	* 3-719-683-01	LABEL, BATTERY FITTING	
24	X-3940-500-1	LID ASSY, CASSETTE	
25	3-733-912-11	SCREW (M2X4.5), SPECIAL HEAD	
26	* 3-704-235-01	LABEL, CAUTION (UK)	
27	1-465-395-41	COMMANDER, REMOTE (RMT-502) (E/Aust)	
	1-465-395-81	COMMANDER, REMOTE (RMT-502) (AEP)	
28	3-724-854-01	CASE, BATTERY	

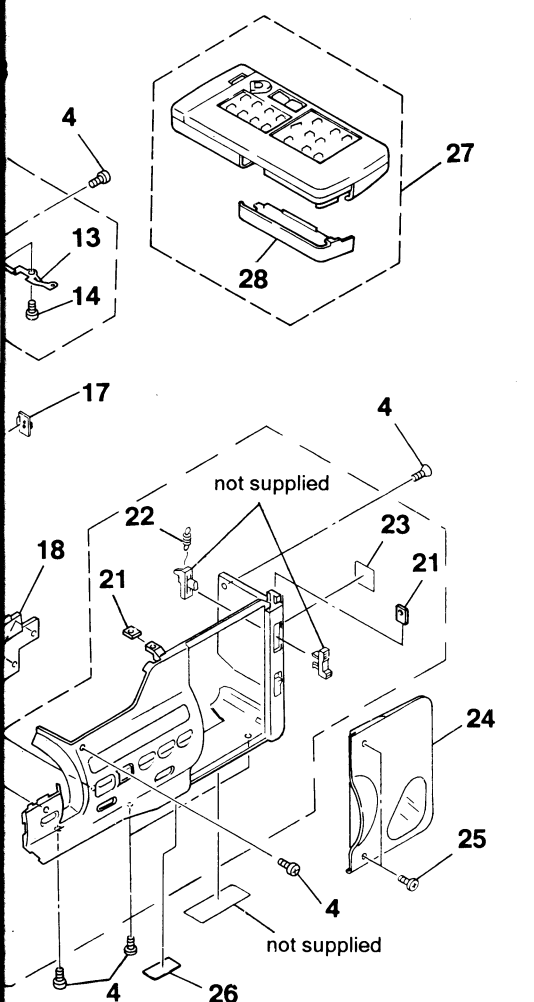
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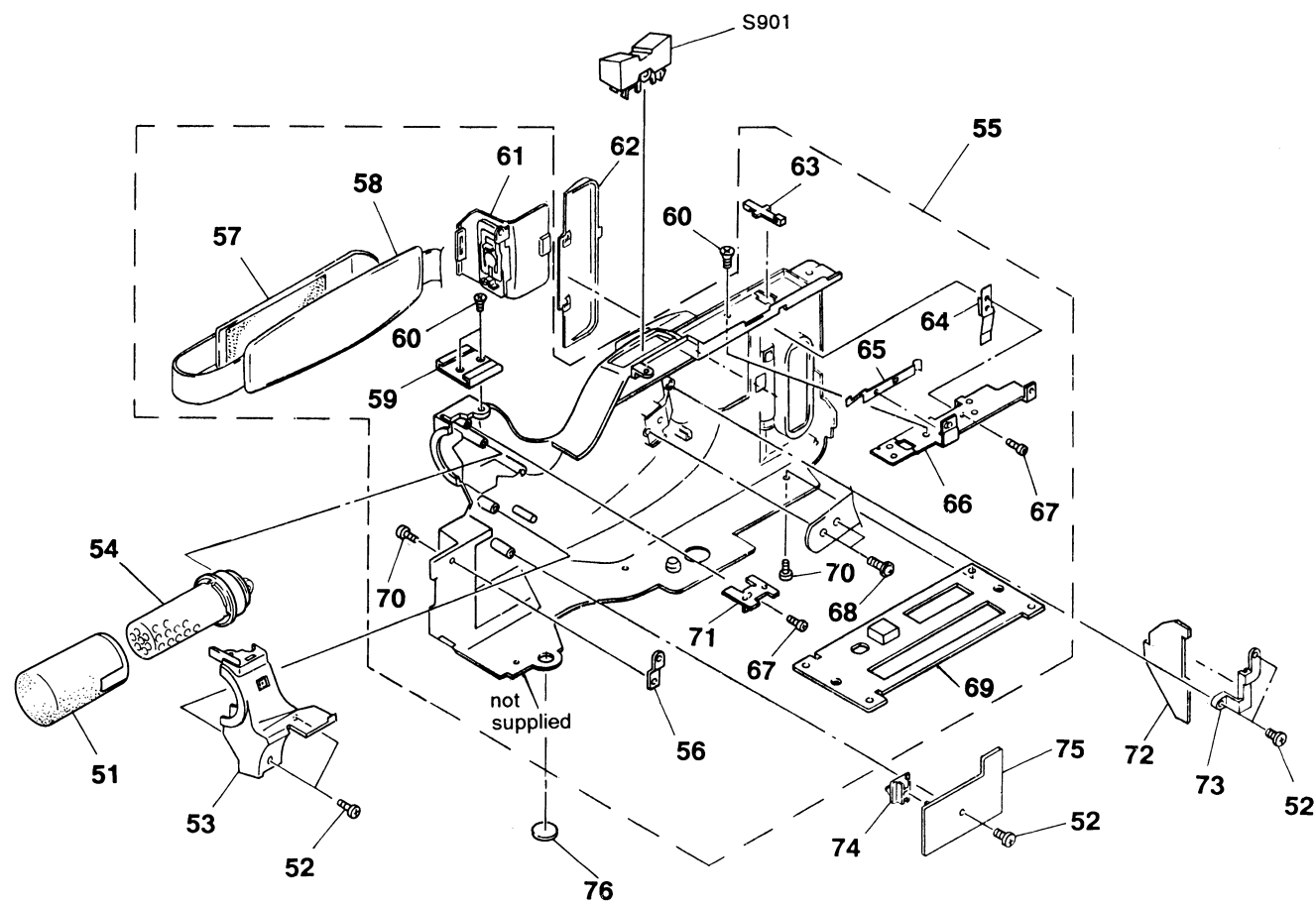
in the

The components identified by
mark Δ or dotted line with mark
 Δ are critical for safety.
Replace only with part number
specified.



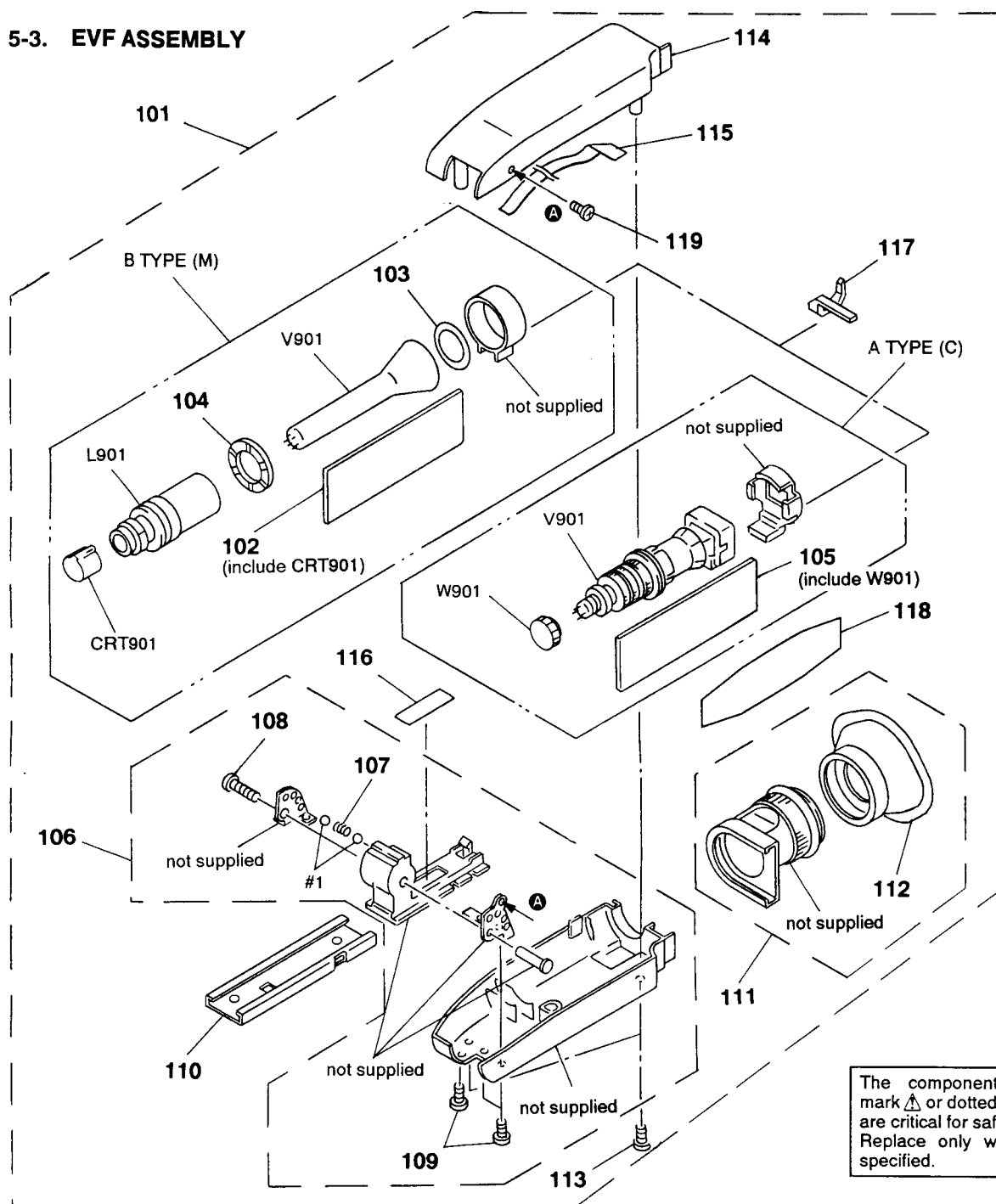
Part No.	Description	Remark
3-744-897-01	KNOB, BILINGUAL	
3-942-255-01	BUTTON, EDIT	
3-744-875-03	KNOB, REMOTE	
* A-7071-426-A	CK-ZK BOARD, COMPLETE	
3-713-790-21	SCREW (M2X6), TAPPING, P3	
X-3940-660-1	CABINET (R) ASSY	
3-718-233-01	NUT, PLATE	
3-674-402-00	SPRING, TENSION	
* 3-719-683-01	LABEL, BATTERY FITTING	
X-3940-500-1	LID ASSY, CASSETTE	
3-733-912-11	SCREW (M2X4.5), SPECIAL HEAD	
* 3-704-235-01	LABEL, CAUTION (UK)	
1-465-395-41	COMMANDER, REMOTE (RMT-502) (E/Australian)	
1-465-395-81	COMMANDER, REMOTE (RMT-502) (AEP/UK)	
3-724-854-01	CASE, BATTERY	

5-2. CABINET (L) ASSEMBLY



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
51	X-2542-033-1	SCREEN ASSY, WINDOW		64	3-942-238-01	SPRING, AV	
52	3-713-790-21	SCREW (M2X6), TAPPING, P3		65	3-744-876-01	SPRING, EVF LOCK	
53	3-942-280-01	HOUSING, MICROPHONE		66	3-942-252-01	PLATE, VF	
54	* 8-814-268-00	MICROPHONE C-2033 SET (STEREO)		67	3-713-790-11	SCREW (M2X5), TAPPING, P3	
55	A-7081-566-B	CABINET (L) BLOCK ASSY (E/Australian)		68	3-669-480-21	+ PTPWH 2	
56	A-7081-639-A	CABINET (L) BLOCK ASSY (AEP/UK)		69	X-3940-497-1	SHEET METAL ASSY, TRIPOD	
57	3-739-866-81	BELT, GRIP		70	3-719-381-01	SCREW (M2X4)	
58	3-724-591-01	PAD, GRIP		71	3-942-240-01	BRACKET, SHOE	
59	3-724-511-01	SHOE, ACCESSORY		72	* A-7071-428-A	SW-175P BOARD, COMPLETE	
60	3-719-831-21	SCREW (M2X4)		73	3-744-808-01	RETAINER, SW	
61	X-3744-825-1	KNOB ASSY, SP		74	3-942-244-01	KNOB, MC	
62	3-744-874-41	LID, CONNECTOR		75	* A-7062-784-A	MC-82P BOARD, COMPLETE	
63	3-744-709-01	LOCK, SLIDE		76	3-725-181-01	CAP, LOWER, AF	
				S901	1-572-692-11	SWITCH, PUSH (ZOOM SWITCH UNIT)	

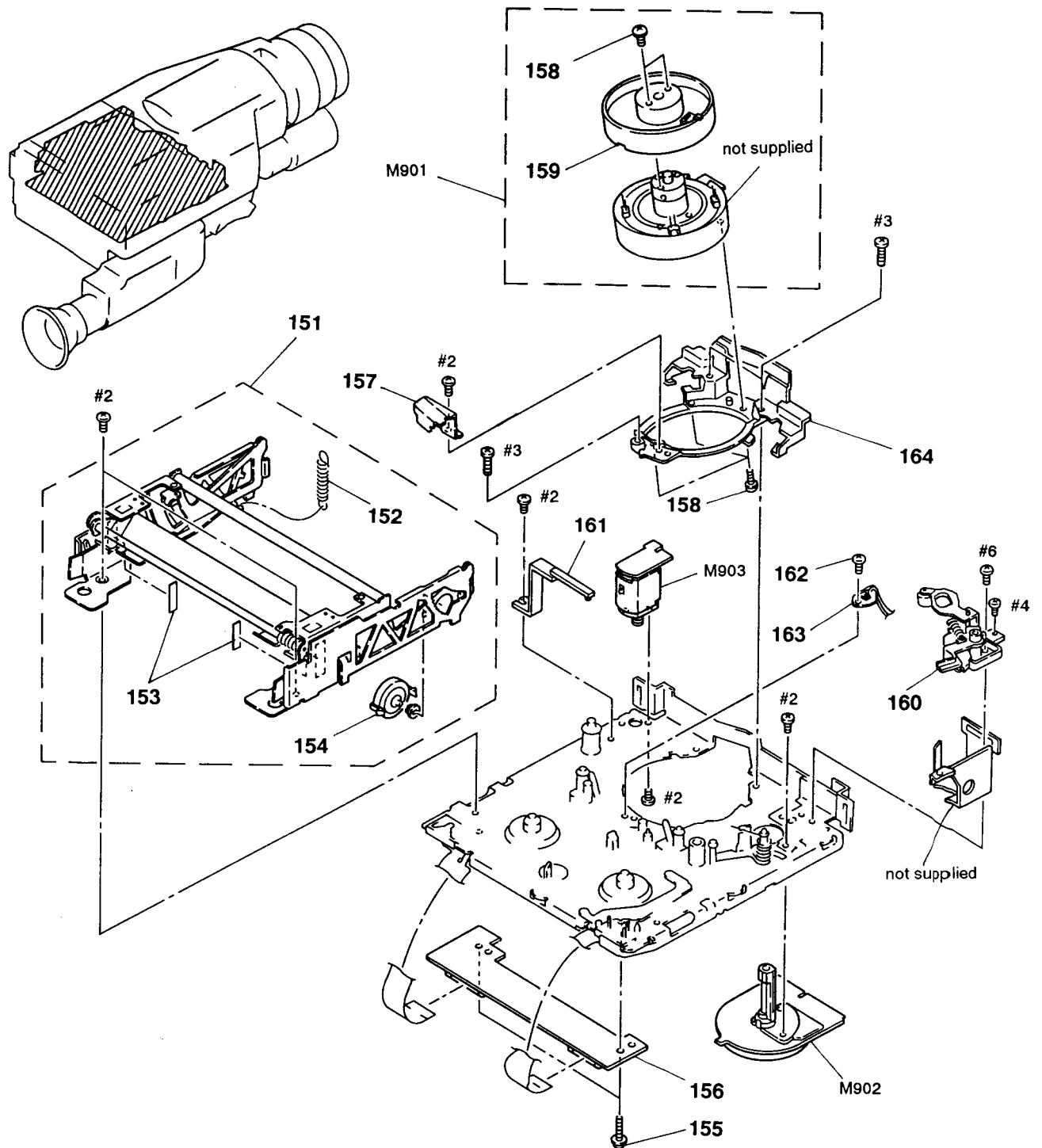
5-3. EVF ASSEMBLY



Ref. No.	Part No.	Description	Remark
101	A-7019-301-A	EVF (M) ASSY (B TYPE)	
	A-7019-302-A	EVF (C) ASSY (A TYPE)	
102	* A-7062-278-A	VF-26P BOARD, COMPLETE (B TYPE (M))	
103	3-724-570-01	RING, CRT FIXED (B TYPE (M))	
104	3-724-549-01	LOCK, CRT (B TYPE (M))	
105	* A-7062-278-A	VF-27P BOARD, COMPLETE (A TYPE (C))	
106	X-3744-701-1	CASE ASSY, LOWER, VF	
107	3-302-492-00	SPRING, COMPRESSION	
108	3-732-012-11	SCREW (M2X5)	
109	3-719-381-01	SCREW (M2X4)	
110	3-744-712-01	SHOE, VF	
111	X-3940-369-1	FINDER (S) ASSY, SPORTS	
112	3-749-142-01	EYE CUP	
113	3-713-790-31	SCREW (M2X8), TAPPING, P3	
114	3-744-705-01	CASE, VF (UPPER)	

Ref. No.	Part No.	Description	Remark
115	1-634-011-11	FP-264 FLEXIBLE BOARD	
116	3-744-716-01	COVER, FL	
117	3-744-722-01	GUIDE, VF TALLY	
118	3-744-775-01	INSULATOR, VF	
119	3-744-720-11	SCREW (M2X3)	
CRT901	Δ 1-526-978-21	SOCKET ASSY, CRT (ON VF-26P BOARD)	(B TYPE (M))
L901	Δ 1-451-310-21	DEFLECTION YOKE (B/W) (ON VF-26P BOARD)	(B TYPE (M))
V901	Δ 1-452-482-11	CRT ASSY (M91JYZ60WB) (ON VF-27P BOARD)	(A TYPE (C))
V901	Δ 1-546-085-11	CATHODE-RAY TUBE, B/W (ON VF-26P BOARD)	(B TYPE (M))
W901	Δ 1-540-019-21	SOCKET ASSY, CRT (ON VF-27P BOARD)	(A TYPE (C))

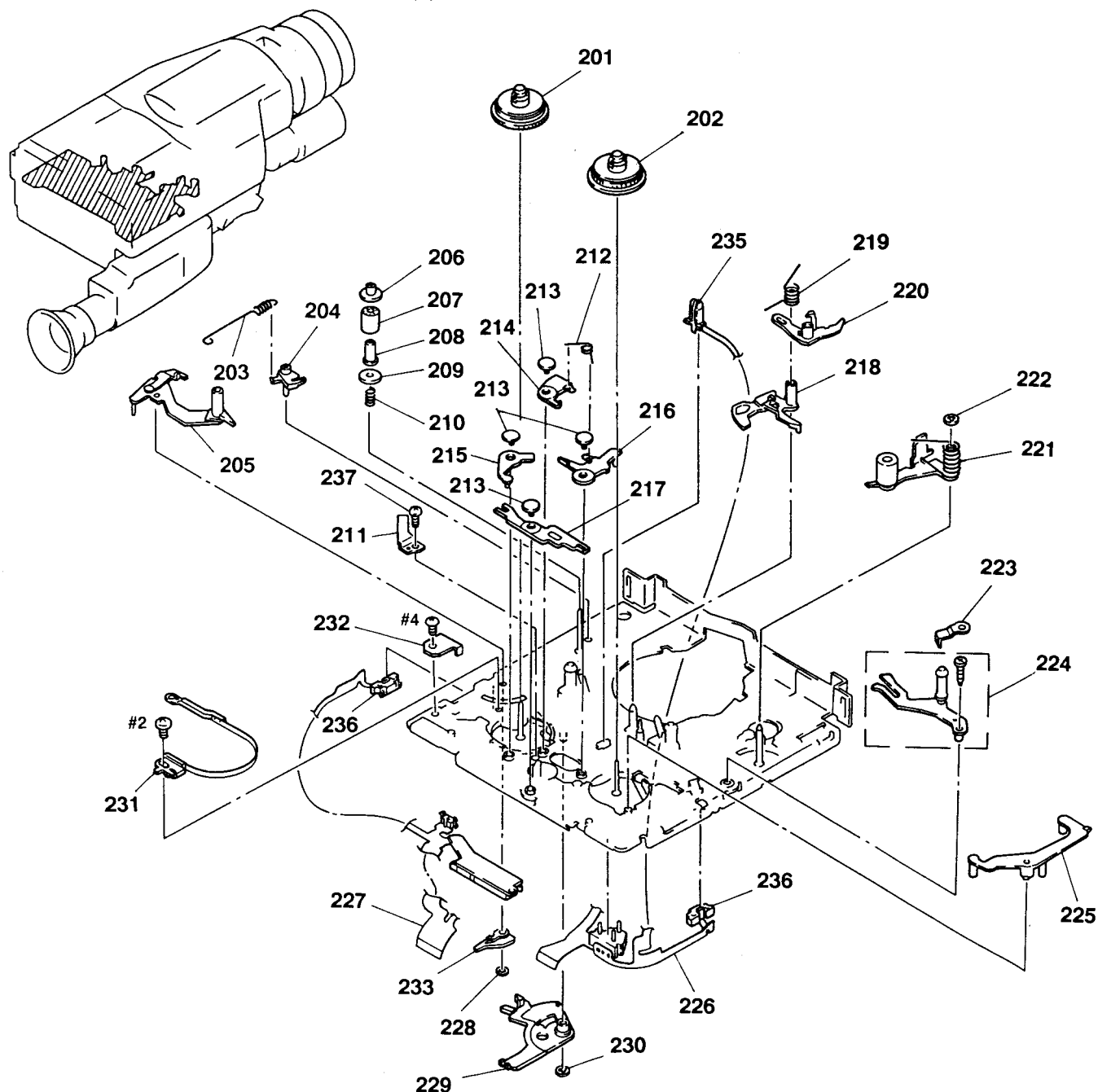
5-4. MECHANICAL DECK ASSEMBLY (1)



Ref. No.	Part No.	Description	Remark
151	X-3940-095-1	CASSETTE COMPARTMENT ASSY (N)	
152	3-728-825-03	SPRING, TENSION	
153	* 3-728-829-01	TAPE	
154	3-728-867-02	DAMPER, OIL	
155	3-719-601-01	SCREW (B2X5), TAPPING	
156	* A-7071-380-A	CC-61P BOARD, COMPLETE	
157	3-728-868-01	GUARD, GUIDE	
158	3-686-493-01	SCREW (M2X5), P1	
159	A-7049-342-A	DRUM ASSY, UPPER, ROTARY (DGR-63-R)	

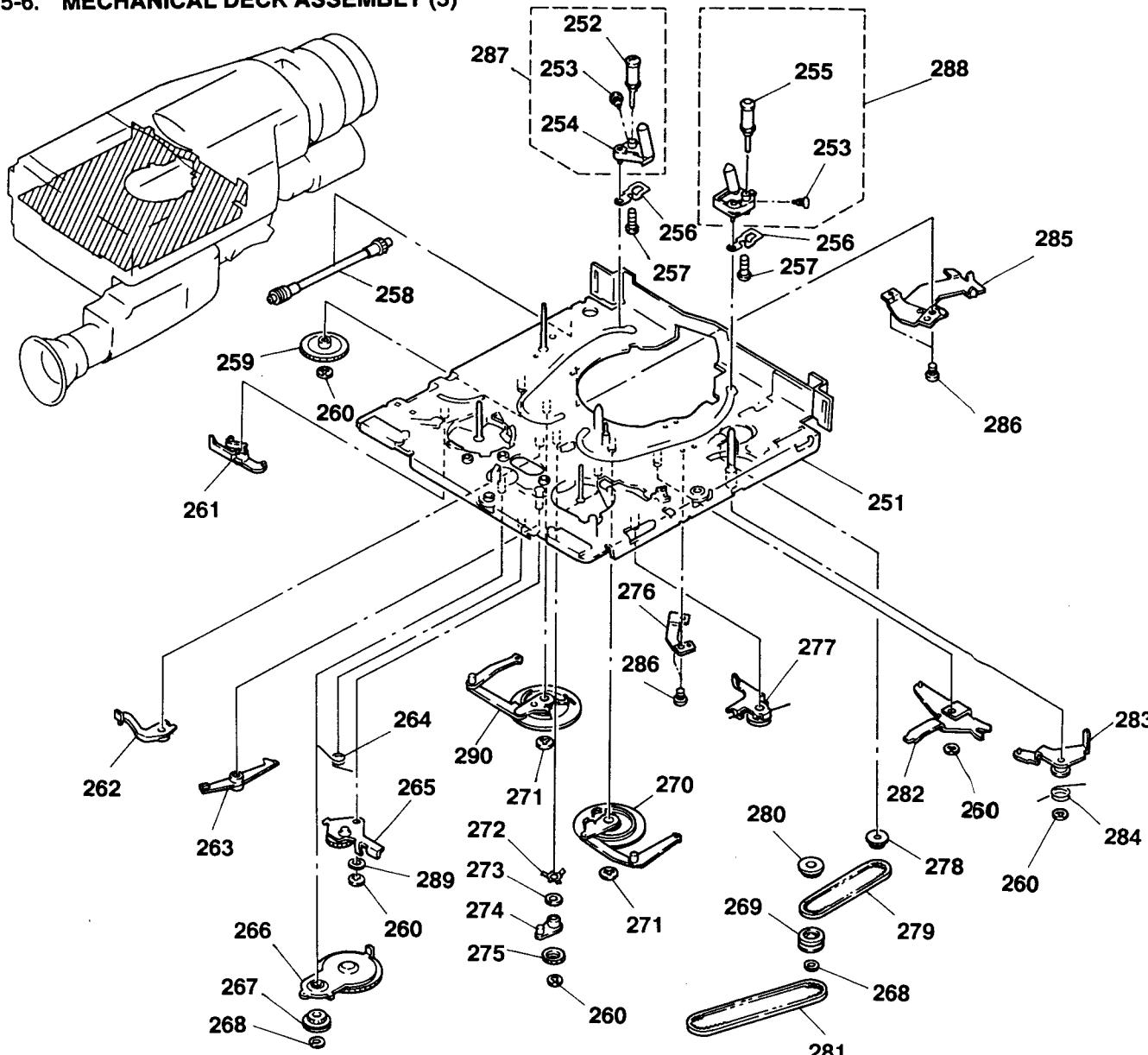
Ref. No.	Part No.	Description	Remark
160	A-7040-205-A	ROLLER BLOCK ASSY (RP), IC	
161	X-3728-864-1	GROUND ASSY, SHAFT	
162	3-732-087-31	SCREW (M1.4X1.8), SPECIAL HEAD	
163	1-808-505-12	SENSOR (DEW SENSOR)	
164	X-3686-482-A	BASE ASSY, DRUM	
M901	A-7048-404-A	DRUM ASSY (DGR-63A-R)	
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)	
M903	A-7040-208-A	MOTOR ASSY, THREADING (LOADING)	

5-5. MECHANICAL DECK ASSEMBLY (2)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
201	X-3728-851-1	TABLE ASSY, REEL, S		220	3-728-852-02	ARM, RK STOPPER	
202	X-3728-855-1	TABLE ASSY, REEL, T		221	A-7040-219-A	ARM BLOCK ASSY, PINCH	
203	3-736-414-01	SPRING, TENSION		222	3-669-465-00	WASHER (1.5), STOPPER	
204	3-728-855-03	ARM, ADJUSTMENT		223	3-728-808-01	SPRING, LEAF	
205	X-3728-867-1	ARM ASSY (S), TENSION REGULATOR		224	X-3728-869-1	ARM ASSY, TG7	
206	3-726-884-01	FLANGE, UPPER, TG2		225	3-728-848-01	ARM, LB RELEASE	
207	3-726-883-01	ROLLER, TG2		226	1-628-061-12	FP-90 FLEXIBLE BOARD	
208	3-726-885-01	SLEEVE, TG2		227	1-628-060-12	FP-89 FLEXIBLE BOARD	
209	3-726-882-02	FLANGE, LOWER, TG2		228	3-321-393-11	WASHER, STOPPER	
210	3-726-886-01	SPRING, COMPRESSION		229	X-3728-863-1	LEVER ASSY, SW	
211	3-726-848-01	RETAINER, TL		230	3-726-829-01	WASHER, STOPPER	
212	3-726-866-01	SPRING (ST), TORSION		231	X-3728-859-1	BAND ASSY, TENSION REGULATOR	
213	3-726-858-01	PIN, SHAFT RETAINER		232	3-730-125-01	RETAINER, SW	
214	3-728-849-01	BRAKE, S		233	X-3728-857-1	STOPPER ASSY, TENSION REGULATOR	
215	3-726-852-01	BRAKE, LB		235	3-728-837-01	HOLDER, LED	
216	3-728-850-01	BRAKE, T		236	3-728-869-02	HOLDER, SENSOR	
217	3-726-853-01	LEVER, LB		237	3-732-087-31	SCREW (M1.4X1.8), SPECIAL HEAD	
218	3-728-875-01	STOPPER, RK					
219	3-726-864-01	SPRING (RK), TORSION					

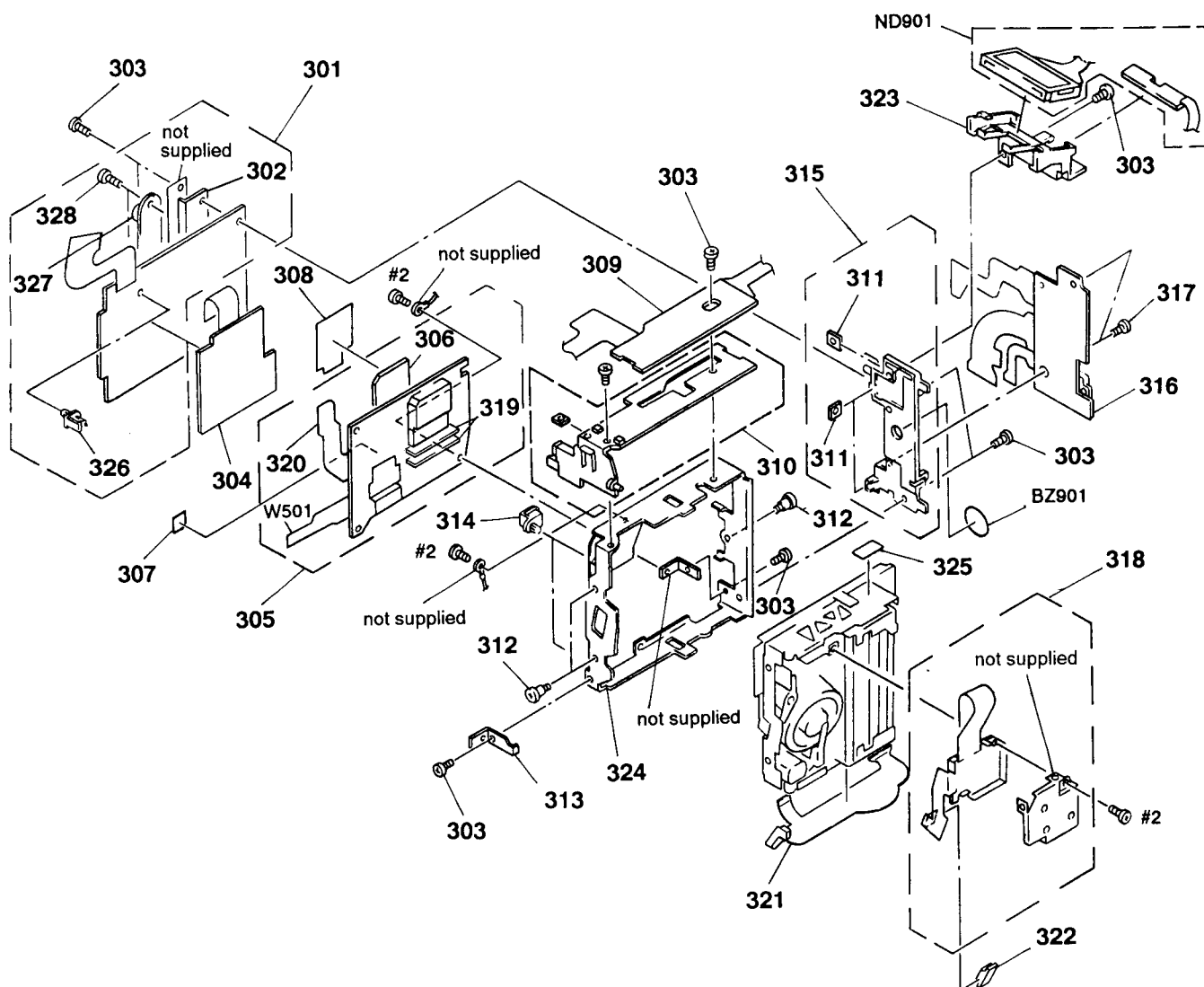
5-6. MECHANICAL DECK ASSEMBLY (3)



Ref. No.	Part No.	Description	Remark
251	X-3728-862-1	CHASSIS ASSY, MECHANICAL	
252	X-3726-820-1	ROLLER ASSY (U), GUIDE	
253	3-726-822-01	SCREW (M1.4X2) (STEP), HEAD	
254	X-3726-818-1	COASTER (LEFT) ASSY	
255	X-3728-808-4	ROLLER ASSY (U) (PLATING), GUIDE	
256	3-736-485-01	SPRING, LEAF, COSTER	
257	3-726-830-01	SCREW (M1.4X4) (THREE LOCK)	
258	X-3728-868-1	WORM ASSY	
259	3-744-109-01	GEAR, WHEEL	
260	3-726-829-01	WASHER, STOPPER	
261	3-728-842-01	LEVER, EJECT	
262	3-728-851-01	BRAKE, UL	
263	3-726-854-01	ARM, BRAKE RELEASE	
264	3-726-865-01	SPRING (LB), TORSION	
265	A-7040-225-A	GEAR BLOCK ASSY (N), LB	
266	X-3728-866-1	GEAR ASSY, RK	
267	X-3728-858-1	GEAR ASSY, RC	
268	3-321-393-11	WASHER, STOPPER	
269	3-741-196-01	PULLEY (LOWER), BELT MIDWAY	
270	X-3728-843-1	GEAR (RIGHT) ASSY, DRIVE	

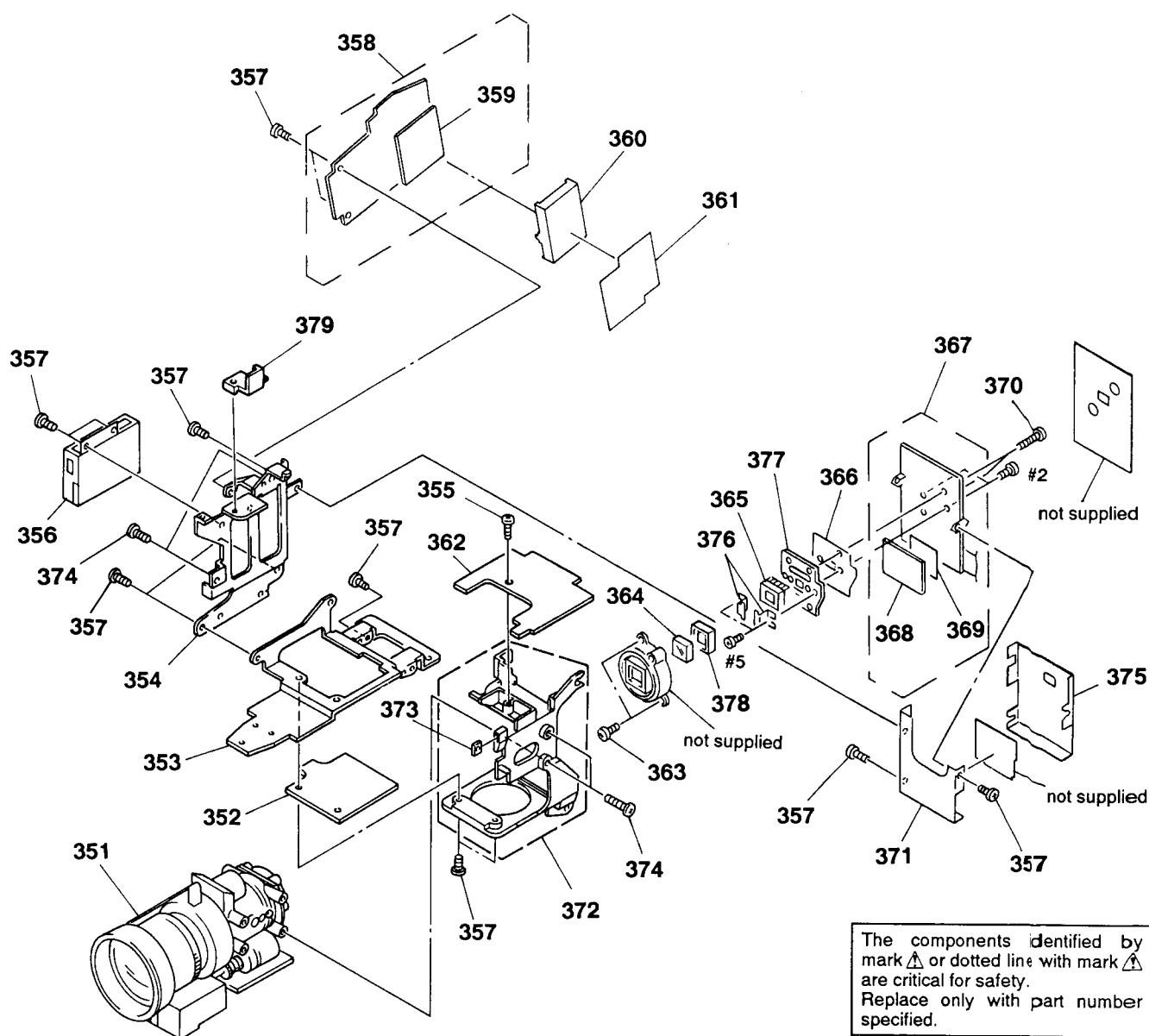
Ref. No.	Part No.	Description	Remark
271	3-669-465-00	WASHER (1.5), STOPPER	
272	3-726-867-01	SPRING, LEAF	
273	3-701-436-21	WASHER, POLYETHYLENE	
274	3-726-857-03	ARM, UL	
275	3-726-856-04	GEAR, UL	
276	* 3-726-805-01	REINFORCEMENT (TT)	
277	X-3726-808-2	BRAKE ASSY, TS	
278	X-3726-805-1	GEAR ASSY, JOINT	
279	3-728-866-11	BELT (S), TIMING	
280	X-3726-813-1	PULLEY (UPPER) ASSY, MIDWAY	
281	3-741-197-01	BELT (L), TIMING	
282	X-3728-846-1	LEVER ASSY, LOADING	
283	X-3726-824-1	ARM ASSY, PINCH SUB	
284	3-726-895-01	SPRING	
285	X-3726-841-1	REINFORCEMENT (SS) ASSY	
286	3-732-087-31	SCREW (M1.4X1.8), SPECIAL HEAD	
287	A-7040-128-A	COASTER (LEFT) BLOCK ASSY	
288	A-7040-217-A	COASTER (RIGHT) BLOCK ASSY (NIP)	
289	3-701-436-01	WASHER, 1.6	
290	X-3728-842-1	GEAR (LEFT) ASSY, DRIVE	

5-7. MAIN BOARDS ASSEMBLY



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
301	* A-7062-780-A	VA-70P BOARD, COMPLETE (AEP/UK)		316	* A-7062-781-A	FU-104P BOARD, COMPLETE	
	* A-7062-851-A	VA-70 (PB) BOARD, COMPLETE (E/Australian)		317	3-713-790-21	SCREW (M2X6), TAPPING, P3	
302	X-3744-801-1	REINFORCEMENT ASSY, VA		318	8-741-509-11	IC SBX1509-11 (RP-77 HIC BOARD)	
303	3-719-381-01	SCREW (M2X4)		319	1-633-942-11	FL-26 BOARD	
304	* A-7062-779-A	CT-40P BOARD, COMPLETE		320	1-633-924-11	FP-248 FLEXIBLE BOARD	
305	* A-7062-778-A	SS-136 (PB) BOARD, COMPLETE		321	1-633-922-11	FP-249 FLEXIBLE BOARD	
306	* X-3744-601-1	CASE ASSY (DD-B), SHIELD		322	1-569-347-11	CONNECTOR, FPC(TRANSLATION) 13P	
307	3-831-441-11	CLOTH, UNWEAVED (25X6X0.5)		323	* 3-744-905-01	HOLDER, LCD	
308	* 3-744-890-01	PLATE, PROTECTION, FLEXIBLE		324	X-3744-602-1	FRAME ASSY, MD	
309	* A-7071-424-A	VK-16P BOARD, COMPLETE (AEP/UK)		325	* 3-730-176-11	SHEET, MD	
309	* A-7071-454-A	VK-16 (PB) BOARD, COMPLETE (E/Australian)		326	3-744-842-01	SUPPORT, CT PC BOARD	
310	X-3940-499-1	TABLE (UPPER) (V) ASSY		327	1-569-556-11	JACK	
311	3-718-233-01	NUT, PLATE		328	3-719-695-01	SCREW (M1.7X3.5), SPECIAL HEAD	
312	3-744-603-21	SCREW		8Z901	1-529-096-11	BUZZER, PIEZOELECTRIC	
313	3-942-235-01	HOOK, LOWER		ND901	1-809-023-11	DISPLAY PANEL, LIQUID CRYSTAL (LCD ASSY)	
314	3-744-609-01	HINGE (C), PC BOARD		W510	1-633-923-11	FP-252 FLEXIBLE BOARD	
315	X-3744-810-1	FRAME (R) ASSY, MD					

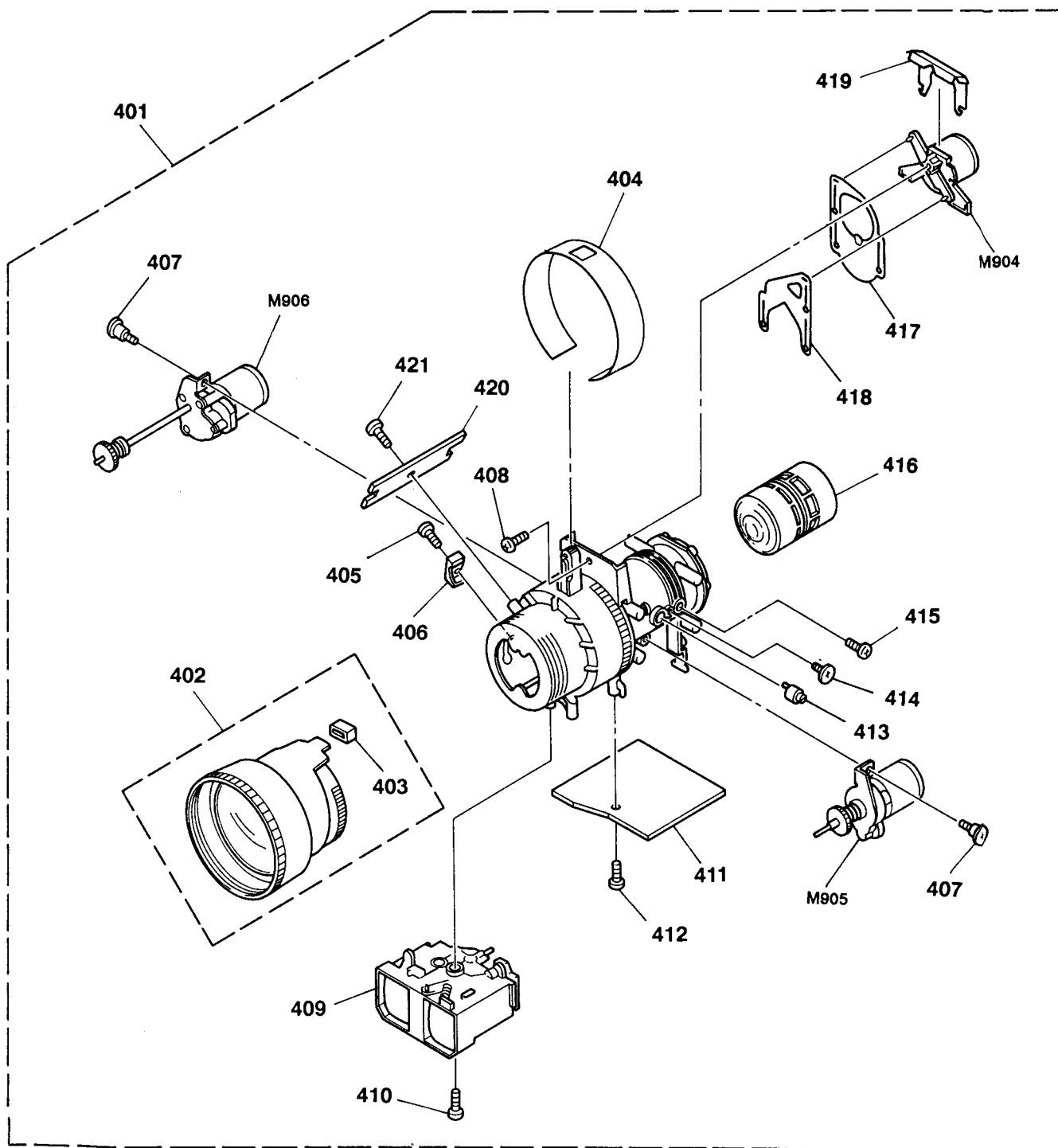
5-8. CAMERA BLOCK ASSEMBLY



Ref. No.	Part No.	Description	Remark
351	1-547-481-11	LENS, ZOOM (VCL-8510XA)	
352	* A-7071-425-A	LI-36P BOARD, COMPLETE	
353	3-942-269-01	PLATE, BASE	
354	3-942-268-01	PLATE, ARM	
355	3-713-790-21	SCREW (M2X6), TAPPING, P3	
356	⚠ 1-466-230-21	CONVERTER UNIT, D/D (DC-DC CONVERTER UNIT)	
357	3-719-381-01	SCREW (M2X4)	
358	* A-7062-776-A	VC-96P BOARD, COMPLETE	
359	A-7068-186-A	MX-10AP HIC BOARD, COMPLETE	
360	* 3-744-763-01	CASE, SHIELD, VC	
361	* 3-744-892-01	INSULATOR, VC	
362	* A-7062-782-A	DK-12P BOARD, COMPLETE	
363	3-738-519-11	SCREW (M2X3), +B	
364	1-547-381-12	FILTER BLOCK, OPTICAL (ON CCD IMAGER)	
365	8-752-604-72	IC ICX039AN-2 (CCD IMAGER) (ON CD-60P BOARD)	

Ref. No.	Part No.	Description	Remark
366	* 3-725-180-01	SHEET, INSULATING, CCD HOLDER	
367	* A-7062-777-A	CD-60P BOARD, COMPLETE	
368	A-7068-173-C	DT-77F HIC BOARD, COMPLETE	
369	* X-3739-811-1	PLATE ASSY, SHIELD, CD	
370	3-335-640-51	SCREW (M2X16)	
371	* X-3744-702-1	CASE (MAIN) ASSY, SHIELD, C	
372	X-3940-498-1	HOLDER ASSY, CAMERA	
373	3-718-233-01	NUT, PLATE	
374	3-719-408-01	SCREW (B2), TAPPING, P3	
375	X-3744-763-1	LID, C SHIELD CASE	
376	* 3-725-175-01	STOPPER, CCD	
377	3-725-176-11	HOLDER, CCD	
378	* 3-725-177-01	RUBBER, SEAL	
379	3-942-555-01	CAMERA PLUS	

**5-9. ZOOM LENS ASSEMBLY
(VCL-8510XA)**



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
401	1-547-481-11	LENS, ZOOM (VCL-8510XA)		413	3-707-453-01	ROLLER, ECCENTRIC	
402	3-708-254-01	LENS ASSY, FOCUS		414	3-707-454-01	SCREW	
403	3-708-243-01	RUBBER, (F) STOPPER		415	3-707-455-01	SCREW, RELAY SET	
404	3-708-246-01	SHEET, ZOOM		416	3-708-252-01	MIRROR TUBE UNIT, RELAY	
405	3-707-445-01	SCREW, (N) STOPPER CLAMP		417	3-707-631-01	WING (A) ASSY, ZOOM	
406	3-707-446-01	STOPPER, (N)		418	3-707-632-01	WING, ZOOM (B)	
407	3-707-447-01	SCREW, MOTOR CLAMP		419	3-708-253-01	COVER, IG METER	
408	3-707-444-01	SCREW, IG METER CLAMP		420	3-708-244-01	PC BOARD ASSY, SW	
409	3-708-248-01	BLOCK ASSY, AF		421	3-707-761-01	SCREW, SW PC BOARD	
410	3-708-249-01	SCREW, AF BLOCK		M904	3-708-245-01	METER, IG (IRIS)	
411	3-708-250-01	PC BOARD ASSY, AF		M905	3-708-251-01	MOTOR ASSY, PZ (ZOOM)	
412	3-707-450-01	SCREW, AF BLOCK CLAMP		M906	3-708-247-01	MOTOR ASSY, AF (FOCUS)	

SECTION 6

ELECTRICAL PARTS LIST

CD-60P

NOTE:

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- **RESISTORS**
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- **SEMICONDUCTORS**
In each case, u : μ , for example:
 $uA...: \mu A..., uPA...: \mu PA...,$
 $uPB...: \mu PB..., uPC...: \mu PC...,$
 $uPD...: \mu PD...$
- **CAPACITORS**
 $uF: \mu F$
- **COILS**
 $uH: \mu H$

Ref. No.	Part No.	Description	Remark
* A-7071-380-A	CC-61P BOARD, COMPLETE		

	(Ref. No 10,000 Series)		
	< CONNECTOR >		
CN511	1-569-363-21	CONNECTOR, FPC 15P	
CN512	1-566-529-11	CONNECTOR, FPC (ZIF) 13P	
CN513	1-566-527-11	CONNECTOR, FPC (ZIF) 11P	

* A-7062-777-A	CD-60P BOARD, COMPLETE		

	(Ref. No 6,000 Series)		
A-7068-173-A	DT-77F BOARD, COMPLETE (HIC)		
	< CAPACITOR >		
C101	1-126-200-11	ELECT CHIP 10uF	20% 35V
C102	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C104	1-128-013-11	ELECT CHIP 1uF	20% 50V
C105	1-126-607-11	ELECT CHIP 47uF	20% 4V
C107	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C110	1-126-206-11	ELECT CHIP 100uF	20% 6.3V
C111	1-162-915-11	CERAMIC CHIP 10PF	0.5PF 50V
C112	1-164-005-11	CERAMIC CHIP 0.47uF	25V
C113	1-128-013-11	ELECT CHIP 1uF	20% 50V
C114	1-128-008-11	ELECT CHIP 3.3uF	20% 35V
C115	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C121	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C122	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C123	1-135-091-00	TANTALUM CHIP 1uF	20% 16V
C124	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C125	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C126	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C127	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C128	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C129	1-163-809-11	CERAMIC CHIP 0.047uF	10% 25V
C130	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C131	1-162-638-11	CERAMIC CHIP 1uF	16V
C135	1-162-638-11	CERAMIC CHIP 1uF	16V
C136	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C137	1-162-919-11	CERAMIC CHIP 22PF	5% 50V
C138	1-162-962-11	CERAMIC CHIP 470PF	10% 50V
C140	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C141	1-162-942-11	CERAMIC CHIP 12PF	5% 50V
C142	1-135-145-11	TANTALUM CHIP 0.47uF	10% 25V
C144	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C147	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C148	1-164-005-11	CERAMIC CHIP 0.47uF	25V
C187	1-162-966-11	CERAMIC CHIP 0.0022uF	10% 50V
C188	1-162-966-11	CERAMIC CHIP 0.0022uF	10% 50V
C189	1-162-966-11	CERAMIC CHIP 0.0022uF	10% 50V
C190	1-162-953-11	CERAMIC CHIP 100PF	5% 50V
C191	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C192	1-126-100-11	ELECT 10uF	20% 6.3V
	< CONNECTOR >		
CN101	* 1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P	
	< TRIMMER >		
CT121	1-141-424-11	CAP, ADJ	
CT122	1-141-356-11	CAP, ADJ 6PF	
	< DIODE >		
D101	8-719-404-46	DIODE MA110	
D102	8-719-404-52	DIODE MA143	
D122	8-719-404-32	DIODE MA141WA	

Ref. No.	Part No.	Description	Remark
D123	8-719-404-46	DIODE MA110	
D124	8-719-404-32	DIODE MA141WA	
D125	8-719-949-46	DIODE 1T32	
D128	8-719-404-46	DIODE MA110	

< IC >

IC121	8-752-326-08	IC CXD1159Q	
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< COIL >

L101	1-412-063-21	INDUCTOR CHIP 68uH	
L121	1-412-058-11	INDUCTOR CHIP 10uH	
L122	1-412-058-11	INDUCTOR CHIP 10uH	
L123	1-410-381-11	INDUCTOR CHIP 10uH	
L182	1-412-058-11	INDUCTOR CHIP 10uH	
L184	1-412-058-11	INDUCTOR CHIP 10uH	

< TRANSISTOR >

Q101	8-765-420-02	TRANSISTOR 2SK300-3/4	
Q102	8-729-905-35	TRANSISTOR 2SC4081	
Q121	8-729-907-47	TRANSISTOR 1M21	
Q122	8-729-402-78	TRANSISTOR XN6401	
Q123	8-729-402-19	TRANSISTOR XN6501	
Q125	8-729-905-35	TRANSISTOR 2SC4081	
Q126	8-729-907-47	TRANSISTOR 1M21	
Q129	8-729-905-23	TRANSISTOR 2SA1576	
Q130	8-729-905-35	TRANSISTOR 2SC4081	
Q131	8-729-907-47	TRANSISTOR 1M21	
Q132	8-729-907-47	TRANSISTOR 1M21	
Q133	8-729-907-47	TRANSISTOR 1M21	
Q135	8-729-907-47	TRANSISTOR 1M21	
Q136	8-729-402-45	TRANSISTOR UN5212	

< RESISTOR >

R101	1-216-845-11	METAL CHIP 100K 5%	1/16W
R102	1-216-840-11	METAL CHIP 39K 5%	1/16W
R103	1-216-820-11	METAL CHIP 820 5%	1/16W
R104	1-216-809-11	METAL CHIP 100 5%	1/16W
R105	1-216-827-11	METAL CHIP 3.3K 5%	1/16W
R108	1-216-864-11	METAL CHIP 0	
R110	1-216-839-11	METAL CHIP 33K 5%	1/16W
R111	1-216-839-11	METAL CHIP 33K 5%	1/16W
R112	1-216-821-11	METAL CHIP 1K 5%	1/16W
R113	1-216-864-11	METAL CHIP 0	
R114	1-216-845-11	METAL CHIP 100K 5%	1/16W
R115	1-216-821-11	METAL CHIP 1K 5%	1/16W
R116	1-216-821-11	METAL CHIP 1K 5%	1/16W
R117	1-216-825-11	METAL CHIP 2.2K 5%	1/16W
R118	1-216-813-11	METAL CHIP 220 5%	1/16W

Ref. No.	Part No.	Description	Remark
R119	1-216-821-11	METAL CHIP 1K 5%	1/16W
R121	1-216-835-11	METAL CHIP 15K 5%	1/16W
R122	1-216-857-11	METAL CHIP 1M 5%	1/16W
R124	1-216-839-11	METAL CHIP 33K 5%	1/16W
R125	1-216-845-11	METAL CHIP 100K 5%	1/16W

R126	1-216-837-11	METAL CHIP 22K 5%	1/16W
R127	1-216-820-11	METAL CHIP 820 5%	1/16W
R128	1-216-843-11	METAL CHIP 68K 5%	1/16W
R129	1-216-833-11	METAL CHIP 10K 5%	1/16W
R130	1-216-835-11	METAL CHIP 15K 5%	1/16W

R131	1-216-844-11	METAL CHIP 82K 5%	1/16W
R132	1-216-844-11	METAL CHIP 82K 5%	1/16W
R133	1-216-850-11	METAL CHIP 270K 5%	1/16W
R207	1-216-841-11	METAL CHIP 47K 5%	1/16W
R208	1-216-825-11	METAL CHIP 2.2K 5%	1/16W

R209	1-216-825-11	METAL CHIP 2.2K 5%	1/16W
R210	1-216-833-11	METAL CHIP 10K 5%	1/16W
R215	1-216-842-11	METAL CHIP 56K 5%	1/16W
R216	1-216-833-11	METAL CHIP 10K 5%	1/16W
R217	1-216-833-11	METAL CHIP 10K 5%	1/16W

R220	1-216-835-11	METAL CHIP 15K 5%	1/16W
R221	1-216-840-11	METAL CHIP 39K 5%	1/16W
R222	1-216-833-11	METAL CHIP 10K 5%	1/16W
R226	1-216-864-11	METAL CHIP 0	
R229	1-216-864-11	METAL CHIP 0	

R230	1-216-833-11	METAL CHIP 10K 5%	1/16W
R231	1-216-813-11	METAL CHIP 220 5%	1/16W
R232	1-216-813-11	METAL CHIP 220 5%	1/16W
R233	1-216-841-11	METAL CHIP 47K 5%	1/16W
R234	1-216-841-11	METAL CHIP 47K 5%	1/16W

R237	1-216-296-00	METAL CHIP 0 5%	1/8W
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< FLEXIBLE BOARD >

W102	1-639-048-11	FP-416 FLEXIBLE BOARD	
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< CRYSTAL >

X121	1-579-076-11	VIBRATOR, CRYSTAL	
X122	1-567-733-11	VIBRATOR, CRYSTAL	

CK-49/ZK-13

CT-40P

Ref. No.	Part No.	Description	Remark
	A-7071-406-A	CK-49/ZK-13 MOUNT (Ref. No 5,000 Series)	

	* 3-942-267-01	HOLDER (CK). LCD	
		< CAPACITOR >	
C691	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
		< DIODE >	
D671	8-719-404-46	DIODE MA110	
D672	8-719-404-46	DIODE MA110	
		< IC >	
IC670	8-759-634-72	IC M34206M2-109FP	
		< COIL >	
L670	1-410-389-31	INDUCTOR CHIP 47uH	
		< DISPLAY PANEL >	
ND670	1-809-022-11	DISPLAY PANEL, LIQUID CRYSTAL	
		< RESISTOR >	
R690	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R691	1-216-295-00	METAL CHIP 0 5% 1/10W	
R692	1-216-097-00	METAL CHIP 100K 5% 1/10W	
		< SWITCH >	
S670	1-570-870-11	SWITCH, SLIDE (AUTO LOCK)	
S671	1-571-787-11	SWITCH, TACTILE (SHUTTER SPEED)	
S672	1-571-787-11	SWITCH, TACTILE (PROGRAM AE)	
S673	1-571-787-11	SWITCH, TACTILE (FOCUS)	
S674	1-571-684-11	SWITCH, TACTIL (PUSH AUTO)	
S675	1-571-684-11	SWITCH, TACTIL (BACK LIGHT)	
S676	1-571-787-11	SWITCH, TACTILE (WHT BAL)	
S681	1-571-684-11	SWITCH, TACTIL (FADER)	
		< FLEXIBLE BOARD >	
W670	1-639-046-11	FP-414 FLEXIBLE BOARD	
W671	1-639-047-11	FP-415 FLEXIBLE BOARD	
		< CRYSTAL >	
X670	1-567-152-00	VIBRATOR, CERAMIC (400MHz)	

Ref. No.	Part No.	Description	Remark
	* A-7062-779-A	CT-40P BOARD, COMPLETE	

		(Ref. No 1,000 Series)	
		< CAPACITOR >	
C700	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C701	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C702	1-128-020-11	ELECT CHIP 10uF 0 6.3V	
C703	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C704	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C706	1-135-177-21	TANTALUM CHIP 1uF 20% 20V	
C708	1-162-915-11	CERAMIC CHIP 10PF 0.5PF 50V	
C709	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C710	1-128-020-11	ELECT CHIP 10uF 0 6.3V	
C711	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C717	1-128-015-11	ELECT CHIP 22uF 0 4V	
C718	1-128-015-11	ELECT CHIP 22uF 0 4V	
C720	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C721	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C723	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C724	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C726	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C727	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C728	1-128-020-11	ELECT CHIP 10uF 0 6.3V	
C729	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C730	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C734	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C735	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C736	1-162-638-11	CERAMIC CHIP 1uF 16V	
C737	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C738	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C739	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C740	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C741	1-162-917-11	CERAMIC CHIP 15PF 5% 50V	
C742	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C743	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C744	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C745	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C746	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C747	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C748	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C749	1-135-145-11	TANTALUM CHIP 0.47uF 10% 25V	
C750	1-162-923-11	CERAMIC CHIP 47PF 5% 50V	
C751	1-135-179-21	TANTAL. CHIP 2.2uF 20% 16V	
C752	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C753	1-162-915-11	CERAMIC CHIP 10PF 0.5PF 50V	
C754	1-162-958-11	CERAMIC CHIP 270PF 5% 50V	
C755	1-162-958-11	CERAMIC CHIP 270PF 5% 50V	
C756	1-162-638-11	CERAMIC CHIP 1uF 16V	

Ref. No.	Part No.	Description	Remark
C757	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C758	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C759	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C760	1-162-916-11	CERAMIC CHIP 12PF	5% 50V
C761	1-162-919-11	CERAMIC CHIP 22PF	5% 50V
C763	1-162-927-11	CERAMIC CHIP 100PF	5% 50V
C769	1-128-049-11	ELECT CHIP 1uF	0 50V
C770	1-126-153-11	ELECT 22uF	20% 6.3V
C773	1-163-809-11	CERAMIC CHIP 0.047uF	10% 25V
C774	1-162-965-11	CERAMIC CHIP 0.0015uF	10% 50V
C799	1-135-178-11	TANTAL. CHIP 1.5uF	20% 20V
C901	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C902	1-135-157-21	TANTALUM CHIP 10uF	20% 6.3V
C903	1-162-947-11	CERAMIC CHIP 33PF	5% 50V
C904	1-162-962-11	CERAMIC CHIP 470PF	10% 50V
C905	1-162-997-11	CERAMIC CHIP 10PF	0.5PF 50V
C906	1-163-123-00	CERAMIC CHIP 180PF	5% 50V
C907	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C908	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C909	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C910	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C911	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C930	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C931	1-135-178-11	TANTAL. CHIP 1.5uF	20% 20V
< CONNECTOR >			
CN705	1-568-336-11	CONNECTOR, BOARD TO BOARD 20P	
< TRIMMER >			
CT701	1-141-331-11	CAP, CHIP TRIMMER 30PF	
CT702	1-141-331-11	CAP, CHIP TRIMMER 30PF	
CT901	1-141-331-11	CAP, CHIP TRIMMER 30PF	
CT902	1-141-417-11	CAP, ADJ 30PF	
< DIODE >			
D901	8-719-949-46	DIODE 1T32	
D903	8-719-404-46	DIODE MA110	
D904	8-719-404-46	DIODE MA110	
D905	8-719-404-46	DIODE MA110	
D906	8-719-404-46	DIODE MA110	
< IC >			
IC701	8-759-998-30	IC CF79028PG	
IC702	8-759-515-28	IC MS6264CLL-15FC	
IC703	8-752-039-49	IC CXA1393AN	
IC704	8-759-634-47	IC M51285BGP	
IC707	8-759-710-29	IC NJM2235M	
IC708	8-759-710-09	IC NJM2233AM	
IC709	8-759-710-09	IC NJM2233AM	

Ref. No.	Part No.	Description	Remark
IC713	8-759-234-20	IC TC7S08F	
IC901	8-759-970-80	IC MB673198U	
IC902	8-759-153-41	IC uPD6451AGT-611	
< COIL >			
L700	1-412-028-11	INDUCTOR CHIP 4.7uH	
L701	1-410-384-31	INDUCTOR CHIP 18uH	
L702	1-412-028-11	INDUCTOR CHIP 4.7uH	
L703	1-412-028-11	INDUCTOR CHIP 4.7uH	
L704	1-412-032-11	INDUCTOR CHIP 100uH	
L705	1-412-028-11	INDUCTOR CHIP 4.7uH	
L901	1-412-032-11	INDUCTOR CHIP 100uH	
L902	1-412-143-11	INDUCTOR 39uH	
L903	1-412-282-41	INDUCTOR 470uH	
< TRANSISTOR >			
Q701	8-729-925-91	TRANSISTOR DTC115EU	
Q702	8-729-907-03	TRANSISTOR FMG5	
Q703	8-729-905-18	TRANSISTOR DTC144EU	
Q704	8-729-905-35	TRANSISTOR 2SC4081	
Q705	8-729-905-24	TRANSISTOR 2SA1576	
Q706	8-729-905-18	TRANSISTOR DTC144EU	
Q707	8-729-905-35	TRANSISTOR 2SC4081	
Q708	8-729-905-15	TRANSISTOR DTC144WU	
Q709	8-729-905-35	TRANSISTOR 2SC4081	
Q710	8-729-905-35	TRANSISTOR 2SC4081	
Q720	8-729-905-18	TRANSISTOR DTC144EU	
Q726	8-729-905-23	TRANSISTOR 2SA1576	
Q727	8-729-905-35	TRANSISTOR 2SC4081	
Q728	8-729-905-35	TRANSISTOR 2SC4081	
Q729	8-729-905-18	TRANSISTOR DTC144EU	
Q730	8-729-905-12	TRANSISTOR DTA144EU	
Q800	8-729-905-18	TRANSISTOR DTC144EU	
Q801	8-729-905-23	TRANSISTOR 2SA1576	
< RESISTOR >			
R700	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R702	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R704	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R706	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R708	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R711	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R713	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R715	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R716	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R717	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R720	1-216-864-11	METAL CHIP 0	
R722	1-216-817-11	METAL CHIP 470 5% 1/16W	
R723	1-216-295-00	METAL CHIP 0 5% 1/10W	

CT-40P

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R724	1-216-845-11	METAL CHIP	100K 5% 1/16W	R902	1-216-864-11	METAL CHIP	0
R725	1-216-833-11	METAL CHIP	10K 5% 1/16W	R903	1-216-864-11	METAL CHIP	0
R729	1-216-864-11	METAL CHIP	0	R904	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
R731	1-216-847-11	METAL CHIP	150K 5% 1/16W	R905	1-216-845-11	METAL CHIP	100K 5% 1/16W
R732	1-216-847-11	METAL CHIP	150K 5% 1/16W	R906	1-216-845-11	METAL CHIP	100K 5% 1/16W
R734	1-216-821-11	METAL CHIP	1K 5% 1/16W	R907	1-216-839-11	METAL CHIP	33K 5% 1/16W
R735	1-216-821-11	METAL CHIP	1K 5% 1/16W	R908	1-216-845-11	METAL CHIP	100K 5% 1/16W
R736	1-216-821-11	METAL CHIP	1K 5% 1/16W	R909	1-216-833-11	METAL CHIP	10K 5% 1/16W
R737	1-216-841-11	METAL CHIP	47K 5% 1/16W	R911	1-216-838-11	METAL CHIP	27K 5% 1/16W
R739	1-216-295-00	METAL CHIP	0 5% 1/10W	R912	1-216-864-11	METAL CHIP	0
R741	1-216-833-11	METAL CHIP	10K 5% 1/16W	R913	1-216-829-11	METAL CHIP	4.7K 5% 1/16W
R742	1-216-833-11	METAL CHIP	10K 5% 1/16W	R914	1-216-833-11	METAL CHIP	10K 5% 1/16W
R745	1-216-845-11	METAL CHIP	100K 5% 1/16W	R915	1-216-830-11	METAL CHIP	5.6K 5% 1/16W
R747	1-216-829-11	METAL CHIP	4.7K 5% 1/16W	R916	1-216-833-11	METAL CHIP	10K 5% 1/16W
R748	1-216-829-11	METAL CHIP	4.7K 5% 1/16W	R917	1-216-842-11	METAL CHIP	56K 5% 1/16W
R749	1-216-837-11	METAL CHIP	22K 5% 1/16W	R918	1-216-834-11	METAL CHIP	12K 5% 1/16W
R750	1-216-838-11	METAL CHIP	27K 5% 1/16W	R919	1-216-864-11	METAL CHIP	0
R751	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R920	1-216-828-11	METAL CHIP	3.9K 5% 1/16W
R753	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R921	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
R754	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R923	1-216-824-11	METAL CHIP	1.8K 5% 1/16W
R755	1-216-829-11	METAL CHIP	4.7K 5% 1/16W	R924	1-216-821-11	METAL CHIP	1K 5% 1/16W
R757	1-216-833-11	METAL CHIP	10K 5% 1/16W	R925	1-216-821-11	METAL CHIP	1K 5% 1/16W
R758	1-216-823-11	METAL CHIP	1.5K 5% 1/16W	R926	1-216-833-11	METAL CHIP	10K 5% 1/16W
R759	1-216-806-11	METAL GLAZE	56 5% 1/16W	R927	1-216-864-11	METAL CHIP	0
R760	1-216-821-11	METAL CHIP	1K 5% 1/16W	R930	1-216-864-11	METAL CHIP	0
R761	1-216-814-11	METAL CHIP	270 5% 1/16W	R932	1-216-864-11	METAL CHIP	0
R762	1-216-845-11	METAL CHIP	100K 5% 1/16W	R933	1-216-841-11	METAL CHIP	47K 5% 1/16W
R763	1-216-843-11	METAL CHIP	68K 5% 1/16W	R934	1-216-840-11	METAL CHIP	39K 5% 1/16W
R764	1-216-832-11	METAL CHIP	8.2K 5% 1/16W	R959	1-216-829-11	METAL CHIP	4.7K 5% 1/16W
R766	1-216-857-11	METAL CHIP	1M 5% 1/16W	R960	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
R770	1-216-864-11	METAL CHIP	0	R961	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
R772	1-216-864-11	METAL CHIP	0	R962	1-216-821-11	METAL CHIP	1K 5% 1/16W
R776	1-216-815-11	METAL CHIP	330 5% 1/16W	R963	1-216-815-11	METAL CHIP	330 5% 1/16W
R777	1-216-823-11	METAL CHIP	1.5K 5% 1/16W	R964	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
R780	1-216-829-11	METAL CHIP	4.7K 5% 1/16W	R966	1-216-833-11	METAL CHIP	10K 5% 1/16W
R781	1-216-836-11	METAL CHIP	18K 5% 1/16W	R967	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
R782	1-216-828-11	METAL CHIP	3.9K 5% 1/16W	R968	1-216-814-11	METAL CHIP	270 5% 1/16W
R783	1-216-832-11	METAL CHIP	8.2K 5% 1/16W	R969	1-216-833-11	METAL CHIP	10K 5% 1/16W
R784	1-216-821-11	METAL CHIP	1K 5% 1/16W	R970	1-216-823-11	METAL CHIP	1.5K 5% 1/16W
R787	1-216-822-11	METAL CHIP	1.2K 5% 1/16W	R976	1-216-829-11	METAL CHIP	4.7K 5% 1/16W
R788	1-216-822-11	METAL CHIP	1.2K 5% 1/16W	R977	1-216-829-11	METAL CHIP	4.7K 5% 1/16W
R789	1-216-829-11	METAL CHIP	4.7K 5% 1/16W	R978	1-216-833-11	METAL CHIP	10K 5% 1/16W
R793	1-216-831-11	METAL CHIP	6.8K 5% 1/16W	R979	1-216-864-11	METAL CHIP	0
R795	1-216-864-11	METAL CHIP	0	R982	1-216-809-11	METAL CHIP	100 5% 1/16W
R796	1-216-827-11	METAL CHIP	3.3K 5% 1/16W	R983	1-216-809-11	METAL CHIP	100 5% 1/16W
R797	1-216-833-11	METAL CHIP	10K 5% 1/16W	R984	1-216-809-11	METAL CHIP	100 5% 1/16W
R798	1-216-829-11	METAL CHIP	4.7K 5% 1/16W				
R901	1-216-864-11	METAL CHIP	0				

Ref. No.	Part No.	Description	Remark
< VARIABLE RESISTOR >			
RV702	1-238-089-11	RES. ADJ. CERMET 4.7K	
RV703	1-238-092-11	RES. ADJ. CERMET 47K	
< CRYSTAL >			
X701	1-567-733-11	VIBRATOR, CRYSTAL	
X703	1-578-690-11	VIBRATOR, CERAMIC	

* A-7062-782-A DK-12P BOARD, COMPLETE			

(Ref. No 5,000 Series)			
* 3-942-236-01 HOLDER, TALLY			
< CAPACITOR >			
C950	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C951	1-163-003-11	CERAMIC CHIP 330PF	10% 50V
C952	1-163-005-11	CERAMIC CHIP 470PF	10% 50V
< CONNECTOR >			
CN950	1-566-532-11	CONNECTOR, FPC (ZIF) 16P	
< DIODE >			
D920	8-719-812-41	LED TLR124, RED	
D921	8-719-404-46	DIODE MA110	
D922	8-719-159-30	DIODE RD8.2SB	
D923	8-719-159-30	DIODE RD8.2SB	
D924	8-719-159-30	DIODE RD8.2SB	
D925	8-719-159-30	DIODE RD8.2SB	
< IC >			
IC950	8-759-145-63	IC uPD7564G-540-E1	
< COIL >			
L950	1-410-389-31	INDUCTOR CHIP 47uH	
L951	1-410-389-31	INDUCTOR CHIP 47uH	
< TRANSISTOR >			
Q950	8-729-901-01	TRANSISTOR DTC144EK	
< RESISTOR >			
R950	1-216-073-00	METAL CHIP 10K 5%	1/10W
R951	1-216-073-00	METAL CHIP 10K 5%	1/10W
R952	1-216-073-00	METAL CHIP 10K 5%	1/10W
R953	1-216-089-00	METAL CHIP 47K 5%	1/10W
R954	1-216-030-00	METAL CHIP 160 5%	1/10W

CT-40P	DK-12P	FR-89	FR-90
Ref. No.	Part No.	Description	Remark
R955	1-216-025-00	METAL CHIP 100 5%	1/10W
R961	1-216-049-00	METAL CHIP 1K 5%	1/10W
< SWITCH >			
S920	1-571-787-11	SWITCH, TACTILE (EDIT -)	
S921	1-571-787-11	SWITCH, TACTILE (EDIT +)	
S950	1-571-787-11	SWITCH, TACTILE (TITLE 1)	
S951	1-571-787-11	SWITCH, TACTILE (TITLE 2)	
S952	1-571-787-11	SWITCH, TACTILE	
S953	1-571-787-11	SWITCH, TACTILE	
< VIBLATOR >			
X950	1-577-163-21	VIBLATOR, CERAMIC (700KHz)	

* 1-628-060-12 FP-89 FLEXIBLE BOARD			

(Ref. No 11,000 Series)			
3-728-869-02 HOLDER, SENSOR			
< DIODE >			
D301	8-719-820-44	PHOTO COUPLER TLP907	
< TRANSISTOR >			
Q301	8-729-906-48	TRANSISTOR EE-TP109	
< SWITCH >			
S301	1-572-173-11	SWITCH, SLIDE (ENCODER) (MODE)	
S903	1-571-099-11	SWITCH (CASSETTE DOWN)	

* 1-628-061-12 FP-90 FLEXIBLE BOARD			

(Ref. No 12,000 Series)			
3-728-837-01 HOLDER, LED			
3-728-869-02 HOLDER, SENSOR			
< DIODE >			
D302	8-719-940-81	DIODE GL452S	
D303	8-719-820-44	PHOTO COUPLER TLP907	
< TRANSISTOR >			
Q302	8-729-906-48	TRANSISTOR EE-TP109	
< SWITCH >			
S302	1-572-298-11	SWITCH, PUSH (REC PROOF, TAPE SELECT)	

FP-249**FU-104P**

Ref. No.	Part No.	Description	Remark
	1-633-922-11	FP-249 FLEXIBLE BOARD *****	
	1-569-286-11	CONNECTOR, CARD EDGE 5P *****	
	* A-7062-781-A	FU-104P BOARD, COMPLETE ***** (Ref. No 10,000 Series)	
		< CAPACITOR >	
C503	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C504	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C505	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C506	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C507	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C514	1-162-917-11	CERAMIC CHIP 15PF 5% 50V	
C515	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C516	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C517	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C518	1-135-155-21	TANTALUM CHIP 4.7uF 10% 10V	
C519	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C994	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C995	1-128-292-11	ELECT 220uF 20% 10V	
C996	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
		< CONNECTOR >	
CN502	1-569-480-11	CONNECTOR, FPC 23P	
CN504	1-569-479-21	CONNECTOR, FPC 21P	
CN992	1-565-528-11	PIN, CONNECTOR (PC BOARD) 3P	
		< TRIMMER >	
CT501	1-141-331-11	CAP, CHIP TRIMMER	
CT501	1-141-424-11	CAP, ADJ	
		< DIODE >	
D501	8-719-421-27	DIODE MA728	
D503	8-719-404-46	DIODE MA110	
D504	8-719-404-46	DIODE MA110	
D505	8-719-404-46	DIODE MA110	
D506	8-719-404-46	DIODE MA110	
D507	8-719-404-46	DIODE MA110	
D510	8-719-812-41	LED TLR124, RED	
D510	8-719-940-99	DIODE SLR-34VC3	
D511	8-719-404-46	DIODE MA110	
		< IC >	
IC501	8-759-154-18	IC uPD75316GF-116-389	
IC502	8-759-511-22	IC CXA1448N	

Ref. No.	Part No.	Description	Remark
IC503	8-759-937-54	IC S-81250HG-RD	
		< JACK >	
J901	1-537-281-21	TERMINAL BOARD (BATTERY/EASY CONNECTOR)	
		< COIL >	
L501	1-412-032-11	INDUCTOR CHIP 100uH	
L990	1-412-026-11	INDUCTOR CHIP 1uH	
L991	1-410-337-11	INDUCTOR 1uH	
L992	1-410-337-11	INDUCTOR 1uH	
L996	1-412-026-11	INDUCTOR CHIP 1uH	
L997	1-412-026-11	INDUCTOR CHIP 1uH	
		< IC LINK >	
PS990	△ 1-532-841-21	LINK, IC	
PS991	△ 1-532-840-21	LINK, IC	
PS992	△ 1-532-840-21	LINK, IC	
		< TRANSISTOR >	
Q509	8-729-904-20	TRANSISTOR FMA2	
Q579	8-729-905-12	TRANSISTOR DTA144EU	
Q990	8-729-101-07	TRANSISTOR 2SB798-DL DK	
Q991	8-729-905-35	TRANSISTOR 2SC4081	
		< RESISTOR >	
R501	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R504	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R505	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R511	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R512	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R513	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R514	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R515	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R516	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R517	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R518	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R520	1-216-864-11	METAL CHIP 0	
R521	1-216-809-11	METAL CHIP 100 5% 1/16W	
R522	1-216-809-11	METAL CHIP 100 5% 1/16W	
R523	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R524	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R525	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R527	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R528	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R529	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R530	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R531	1-216-809-11	METAL CHIP 100 5% 1/16W	
R532	1-216-809-11	METAL CHIP 100 5% 1/16W	

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

FU-104P**LI-36P****MC-82P**

Ref. No.	Part No.	Description	Remark		
R533	1-216-821-11	METAL CHIP	1K	5%	1/16W
R534	1-216-821-11	METAL CHIP	1K	5%	1/16W
R535	1-216-821-11	METAL CHIP	1K	5%	1/16W
R536	1-216-821-11	METAL CHIP	1K	5%	1/16W
R537	1-216-817-11	METAL CHIP	470	5%	1/16W
R538	1-216-821-11	METAL CHIP	1K	5%	1/16W
R539	1-216-841-11	METAL CHIP	47K	5%	1/16W
R540	1-216-841-11	METAL CHIP	47K	5%	1/16W
R541	1-216-841-11	METAL CHIP	47K	5%	1/16W
R542	1-216-833-11	METAL CHIP	10K	5%	1/16W
R543	1-216-833-11	METAL CHIP	10K	5%	1/16W
R544	1-216-833-11	METAL CHIP	10K	5%	1/16W
R545	1-216-821-11	METAL CHIP	1K	5%	1/16W
R546	1-216-821-11	METAL CHIP	1K	5%	1/16W
R547	1-216-833-11	METAL CHIP	10K	5%	1/16W
R548	1-216-833-11	METAL CHIP	10K	5%	1/16W
R549	1-216-833-11	METAL CHIP	10K	5%	1/16W
R550	1-216-833-11	METAL CHIP	10K	5%	1/16W
R551	1-216-833-11	METAL CHIP	10K	5%	1/16W
R552	1-216-833-11	METAL CHIP	10K	5%	1/16W
R553	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R557	1-216-861-11	METAL CHIP	2.2M	5%	1/16W
R558	1-216-841-11	METAL CHIP	47K	5%	1/16W
R559	1-216-841-11	METAL CHIP	47K	5%	1/16W
R563	1-216-864-11	METAL CHIP	0		
R564	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R571	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R572	1-216-821-11	METAL CHIP	1K	5%	1/16W
R573	1-216-821-11	METAL CHIP	1K	5%	1/16W
R575	1-216-864-11	METAL CHIP	0		
R578	1-216-833-11	METAL CHIP	10K	5%	1/16W
R579	1-216-864-11	METAL CHIP	0		
R590	1-216-833-11	METAL CHIP	10K	5%	1/16W
R990	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R991	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R992	1-216-820-11	METAL CHIP	820	5%	1/16W
R993	1-216-836-11	METAL CHIP	18K	5%	1/16W
R994	1-216-807-11	METAL CHIP	68	5%	1/16W
< SWITCH >					
S501	1-571-275-31	SWITCH, SLIDE			
S502	1-572-284-11	SWITCH, SLIDE			
< FLEXIBLE BOARD >					
W501	1-633-978-11	FP-295 FLEXIBLE BOARD			
W502	1-633-977-11	FP-293 FLEXIBLE BOARD			
W901	1-633-982-11	FP-294 FLEXIBLE BOARD			

Ref. No.	Part No.	Description	Remark		
< VIBRATOR >					
X501	1-577-101-11	VIBRATOR, CERAMIC			
X502	1-527-997-21	VIBRATOR, CRYSTAL			

* A-7071-425-A LI-36P BOARD, COMPLETE					

(Ref.No 6,000 Series)					
< CAPACITOR >					
C970	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C971	1-163-035-00	CERAMIC CHIP	0.047uF		50V
< CONNECTOR >					
CN961	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P			
< JACK >					
J902	1-550-104-11	HOLDER, BATTERY (LITHIUM)			

* A-7062-784-A MC-82P BOARD, COMPLETE					

< CAPACITOR >					
C650	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C651	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C653	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C655	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C656	1-126-154-11	ELECT	47uF	20%	6.3V
C657	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C659	1-162-638-11	CERAMIC CHIP	1uF		16V
C661	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C662	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C665	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C667	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C668	1-126-154-11	ELECT	47uF	20%	6.3V
C669	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C671	1-162-638-11	CERAMIC CHIP	1uF		16V
C673	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C674	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C675	1-162-638-11	CERAMIC CHIP	1uF		16V
C676	1-162-638-11	CERAMIC CHIP	1uF		16V
C677	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C678	1-126-155-11	ELECT	100uF	20%	6.3V
C679	1-162-638-11	CERAMIC CHIP	1uF		16V
C680	1-126-155-11	ELECT	100uF	20%	6.3V
C681	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V

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Ref. No.	Part No.	Description	Remark
C683	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C684	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C685	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V
C686	1-164-633-11	CERAMIC CHIP 0.1uF	10% 25V
C687	1-162-638-11	CERAMIC CHIP 1uF	16V

< CONNECTOR >

CN650	1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P
CN652	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P

< DIODE >

D652	8-719-106-43	DIODE RD9.1M
D655	8-719-404-46	DIODE MA110

< IC >

IC650	8-759-822-37	IC LA7293M-TE-L
IC651	8-759-822-37	IC LA7293M-TE-L

< JACK >

J650	1-507-899-00	JACK (SMALL TYPE) (EXT MIC)
J651	1-563-454-11	JACK, MINIATURE (RFU DC OUT)

< COIL >

L650	1-410-369-11	INDUCTOR CHIP 1uH
L651	1-410-369-11	INDUCTOR CHIP 1uH
L652	1-410-192-51	INDUCTOR CHIP 1uH
L653	1-410-192-51	INDUCTOR CHIP 1uH
L654	1-410-369-11	INDUCTOR CHIP 1uH

< TRANSISTOR >

Q650	8-729-109-44	TRANSISTOR 2SK94
Q651	8-729-905-35	TRANSISTOR 2SC4081
Q653	8-729-905-35	TRANSISTOR 2SC4081
Q654	8-729-905-12	TRANSISTOR DTA144EU
Q655	8-729-905-12	TRANSISTOR DTA144EU
Q656	8-729-109-44	TRANSISTOR 2SK94
Q657	8-729-905-35	TRANSISTOR 2SC4081
Q658	8-729-904-07	TRANSISTOR FMG2-T-149
Q659	8-729-905-35	TRANSISTOR 2SC4081

< RESISTOR >

R650	1-216-833-11	METAL CHIP 10K 5%	1/16W
R652	1-216-833-11	METAL CHIP 10K 5%	1/16W
R653	1-216-844-11	METAL CHIP 82K 5%	1/16W
R654	1-216-845-11	METAL CHIP 100K 5%	1/16W
R655	1-216-826-11	METAL CHIP 2.7K 5%	1/16W
R656	1-216-828-11	METAL CHIP 3.9K 5%	1/16W
R657	1-216-833-11	METAL CHIP 10K 5%	1/16W
R659	1-216-833-11	METAL CHIP 10K 5%	1/16W

Ref. No.	Part No.	Description	Remark
R660	1-216-844-11	METAL CHIP 82K 5%	1/16W
R661	1-216-845-11	METAL CHIP 100K 5%	1/16W

R662	1-216-826-11	METAL CHIP 2.7K 5%	1/16W
R663	1-216-828-11	METAL CHIP 3.9K 5%	1/16W
R664	1-216-831-11	METAL CHIP 6.8K 5%	1/16W
R667	1-216-831-11	METAL CHIP 6.8K 5%	1/16W
R670	1-216-842-11	METAL CHIP 56K 5%	1/16W

R671	1-216-842-11	METAL CHIP 56K 5%	1/16W
R672	1-216-845-11	METAL CHIP 100K 5%	1/16W
R673	1-216-845-11	METAL CHIP 100K 5%	1/16W
R674	1-216-841-11	METAL CHIP 47K 5%	1/16W
R678	1-216-841-11	METAL CHIP 47K 5%	1/16W

R679	1-216-857-11	METAL CHIP 1M 5%	1/16W
R680	1-216-857-11	METAL CHIP 1M 5%	1/16W
R681	1-216-841-11	METAL CHIP 47K 5%	1/16W
R682	1-216-864-11	METAL CHIP 0	
R683	1-216-864-11	METAL CHIP 0	

R696	1-216-825-11	METAL CHIP 2.2K 5%	1/16W
R697	1-216-825-11	METAL CHIP 2.2K 5%	1/16W

< SWITCH >

S650	1-553-977-00	SWITCH, SLIDE
S651	1-571-787-41	SWITCH, TACTILE

* A-7062-778-A SS-136 (PB) BOARD, COMPLETE

(Ref. No 3,000 Series)

1-236-550-11 BPF
1-236-551-11 BPF
1-562-880-11 CONNECTOR, CARD EDGE 15P
1-569-346-11 CONNECTOR, FPC (TRANSLATION) 10P
1-569-420-11 CONNECTOR, BOARD TO BOARD 2P

1-633-924-11 FP-248 FLEXIBLE BOARD
1-633-942-11 FL-26 BOARD
3-831-441-11 CLOTH, UNWEAVED (25X6X0.5)

< CAPACITOR >

C400	1-162-970-11	CERAMIC CHIP 0.01uF	10%	25V
C401	1-162-970-11	CERAMIC CHIP 0.01uF	10%	25V
C402	1-162-970-11	CERAMIC CHIP 0.01uF	10%	25V
C406	1-162-970-11	CERAMIC CHIP 0.01uF	10%	25V
C407	1-162-970-11	CERAMIC CHIP 0.01uF	10%	25V
C408	1-163-038-00	CERAMIC CHIP 0.1uF		25V
C409	1-163-038-00	CERAMIC CHIP 0.1uF		25V
C501	1-126-157-11	ELECT 10uF	20%	16V
C502	1-126-160-11	ELECT 1uF	20%	50V
C504	1-163-038-00	CERAMIC CHIP 0.1uF		25V

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C505	1-164-633-11	CERAMIC CHIP	0.1uF 10% 25V	C556	1-163-035-00	CERAMIC CHIP	0.047uF 50V
C506	1-126-163-11	ELECT	4.7uF 20% 50V	C557	1-163-081-00	CERAMIC CHIP	0.22uF 25V
C507	1-164-330-21	CERAMIC CHIP	0.22uF 10% 16V	C559	1-162-921-11	CERAMIC CHIP	33PF 5% 50V
C508	1-164-330-21	CERAMIC CHIP	0.22uF 10% 16V	C560	1-162-921-11	CERAMIC CHIP	33PF 5% 50V
C509	1-162-967-11	CERAMIC CHIP	0.0033uF 10% 50V	C561	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C510	1-162-967-11	CERAMIC CHIP	0.0033uF 10% 50V	C562	1-126-157-11	ELECT	10uF 20% 16V
C511	1-162-967-11	CERAMIC CHIP	0.0033uF 10% 50V	C563	1-126-157-11	ELECT	10uF 20% 16V
C512	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C564	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C513	1-128-078-11	ELECT	33uF 20% 10V	C565	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V
C514	1-130-495-00	MYLAR	0.1uF 5% 50V	C566	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V
C515	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V	C567	1-163-037-11	CERAMIC CHIP	0.022uF 10% 25V
C516	1-164-633-11	CERAMIC CHIP	0.1uF 10% 25V	C568	1-163-037-11	CERAMIC CHIP	0.022uF 10% 25V
C517	1-162-969-11	CERAMIC CHIP	0.0068uF 10% 25V	C569	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C518	1-163-038-00	CERAMIC CHIP	0.1uF 25V	C592	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C519	1-164-330-21	CERAMIC CHIP	0.22uF 10% 16V	C609	1-128-078-11	ELECT	33uF 20% 10V
C520	1-164-330-21	CERAMIC CHIP	0.22uF 10% 16V	C610	1-124-589-11	ELECT	47uF 20% 16V
C521	1-164-330-21	CERAMIC CHIP	0.22uF 10% 16V	C620	1-164-227-11	CERAMIC CHIP	0.022uF 10% 25V
C522	1-162-638-11	CERAMIC CHIP	1uF 16V	C625	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C523	1-128-078-11	ELECT	33uF 20% 10V	C720	1-162-967-11	CERAMIC CHIP	0.0033uF 10% 50V
C524	1-163-035-00	CERAMIC CHIP	0.047uF 50V	C901	1-162-921-11	CERAMIC CHIP	33PF 5% 50V
C525	1-126-162-11	ELECT	3.3uF 20% 50V	C902	1-164-633-11	CERAMIC CHIP	0.1uF 10% 25V
C526	1-163-038-00	CERAMIC CHIP	0.1uF 25V	C903	1-164-227-11	CERAMIC CHIP	0.022uF 10% 25V
C528	1-162-917-11	CERAMIC CHIP	15PF 5% 50V	C904	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V
C529	1-162-917-11	CERAMIC CHIP	15PF 5% 50V	C905	1-164-227-11	CERAMIC CHIP	0.022uF 10% 25V
C530	1-126-157-11	ELECT	10uF 20% 16V	C906	1-164-227-11	CERAMIC CHIP	0.022uF 10% 25V
C531	1-126-157-11	ELECT	10uF 20% 16V	C907	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V
C532	1-162-961-11	CERAMIC CHIP	330PF 10% 50V	C908	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V
C533	1-162-968-11	CERAMIC CHIP	0.0047uF 10% 50V	C909	1-128-078-11	ELECT	33uF 20% 10V
C534	1-162-967-11	CERAMIC CHIP	0.0033uF 10% 50V	C910	1-128-078-11	ELECT	33uF 20% 10V
C535	1-163-035-00	CERAMIC CHIP	0.047uF 50V	C911	1-128-078-11	ELECT	33uF 20% 10V
C536	1-162-962-11	CERAMIC CHIP	470PF 10% 50V	C912	1-127-558-11	ELECT (SOLID)	10uF 20% 10V
C537	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V	C913	1-128-078-11	ELECT	33uF 20% 10V
C538	1-162-949-11	CERAMIC CHIP	47PF 5% 50V	C914	1-127-561-11	ELECT (SOLID)	33uF 20% 10V
C539	1-162-941-11	CERAMIC CHIP	10PF 0.5PF 50V	C915	1-127-558-11	ELECT (SOLID)	10uF 20% 10V
C540	1-162-965-11	CERAMIC CHIP	0.0015uF 10% 50V	C916	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C541	1-162-945-11	CERAMIC CHIP	22PF 5% 50V	C917	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C542	1-164-247-11	CERAMIC CHIP	0.047uF 10% 16V	C918	1-164-633-11	CERAMIC CHIP	0.1uF 10% 25V
C543	1-164-247-11	CERAMIC CHIP	0.047uF 10% 16V	C920	1-164-633-11	CERAMIC CHIP	0.1uF 10% 25V
C545	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V	C921	1-164-633-11	CERAMIC CHIP	0.1uF 10% 25V
C546	1-164-633-11	CERAMIC CHIP	0.1uF 10% 25V	C922	1-164-633-11	CERAMIC CHIP	0.1uF 10% 25V
C547	1-164-232-11	CERAMIC CHIP	0.01uF 50V	C923	1-162-966-11	CERAMIC CHIP	0.0022uF 10% 50V
C548	1-162-638-11	CERAMIC CHIP	1uF 16V	C925	1-164-217-11	CERAMIC CHIP	150PF 0.25PF 50V
C549	1-162-638-11	CERAMIC CHIP	1uF 16V	C930	1-162-967-11	CERAMIC CHIP	0.0033uF 10% 50V
C550	1-162-966-11	CERAMIC CHIP	0.0022uF 10% 50V	C931	1-162-967-11	CERAMIC CHIP	0.0033uF 10% 50V
C551	1-163-023-00	CERAMIC CHIP	0.015uF 5% 50V	C932	1-162-967-11	CERAMIC CHIP	0.0033uF 10% 50V
C552	1-163-038-00	CERAMIC CHIP	0.1uF 25V	C935	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C553	1-162-962-11	CERAMIC CHIP	470PF 10% 50V	< CONNECTOR >			
C554	1-164-232-11	CERAMIC CHIP	0.01uF 50V	CN501	* 1-565-211-11	CONNECTOR, FPC (ZIF) 22P	
C555	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V				

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Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
CN502	1-569-364-21	CONNECTOR, FPC 19P		< TRANSISTOR >			
CN503	1-565-878-11	PIN, CONNECTOR (PC BOARD) 6P		Q400	8-729-905-35	TRANSISTOR 2SC4081T106Q	
CN505	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P		Q401	8-729-905-35	TRANSISTOR 2SC4081T106Q	
CN506	1-569-627-11	CONNECTOR, BOARD TO BOARD 16P		Q402	8-729-905-35	TRANSISTOR 2SC4081T106Q	
CN507	1-569-626-11	CONNECTOR, BOARD TO BOARD 20P		Q403	8-729-905-35	TRANSISTOR 2SC4081T106Q	
CN508	1-565-530-11	PIN, CONNECTOR (PC BOARD) 5P		Q404	8-729-905-35	TRANSISTOR 2SC4081T106Q	
CN509	1-568-207-11	CONNECTOR, FPC (ZIF) 23P		Q502	8-729-905-35	TRANSISTOR 2SC4081T106Q	
< DIODE >				Q503	8-729-905-24	TRANSISTOR 2SA1576T106S	
D501	8-719-941-86	DIODE DAN202U		Q505	8-729-905-35	TRANSISTOR 2SC4081T106Q	
D506	8-719-941-86	DIODE DAN202U		Q506	8-729-905-24	TRANSISTOR 2SA1576T106S	
D510	8-719-404-46	DIODE MA110		Q507	8-729-905-35	TRANSISTOR 2SC4081T106Q	
D901	8-719-938-75	DIODE SB05-05CP		Q508	8-729-905-24	TRANSISTOR 2SA1576T106S	
D902	8-719-938-75	DIODE SB05-05CP		Q509	8-729-905-35	TRANSISTOR 2SC4081T106Q	
D903	8-719-938-78	DIODE SB10-05PCP		Q510	8-729-905-35	TRANSISTOR 2SC4081T106Q	
< IC >				Q511	8-729-905-24	TRANSISTOR 2SA1576T106S	
IC501	8-752-818-70	IC CXP80116-830Q		Q512	8-729-907-00	TRANSISTOR DTC114EU	
IC502	8-759-148-05	IC CXA8010M		Q513	8-729-905-35	TRANSISTOR 2SC4081T106Q	
IC503	8-759-990-55	IC CXA8006M		Q514	8-729-905-35	TRANSISTOR 2SC4081T106Q	
IC504	8-752-056-72	IC CXA1127M		Q515	8-729-905-18	TRANSISTOR DTC144EU	
IC506	8-752-055-48	IC CXA1204Q		Q516	8-729-905-18	TRANSISTOR DTC144EU	
IC507	8-759-100-93	IC uPC393G2		Q540	8-729-822-48	TRANSISTOR FC101-TR	
IC507	8-759-509-91	IC XRA10393F		Q901	8-729-805-25	TRANSISTOR 2SB1121-ST-TD	
IC507	8-759-998-92	IC LM393DR		Q902	8-729-805-25	TRANSISTOR 2SB1121-ST-TD	
IC508	8-759-748-72	IC BR93C46F		Q903	8-729-805-25	TRANSISTOR 2SB1121-ST-TD	
IC508	8-759-979-38	IC AK93C46F		Q904	8-729-820-47	TRANSISTOR 2SB1202FAT-TL	
IC901	8-759-500-42	IC MB3783PFV		Q905	8-729-905-35	TRANSISTOR 2SC4081T106Q	
< COIL >				< RESISTOR >			
L503	1-408-795-21	INDUCTOR CHIP 330uH		R400	1-216-837-11	METAL CHIP 22K 5% 1/16W	
L505	1-410-381-11	INDUCTOR CHIP 10uH		R401	1-216-837-11	METAL CHIP 22K 5% 1/16W	
L515	1-412-028-11	INDUCTOR CHIP 4.7uH		R402	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
L901	1-424-104-11	COIL, CHOKE 10uH		R403	1-216-821-11	METAL CHIP 1K 5% 1/16W	
L902	1-424-104-11	COIL, CHOKE 10uH		R404	1-216-821-11	METAL CHIP 1K 5% 1/16W	
L903	1-424-106-11	COIL, CHOKE 47uH		R405	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
L904	1-424-106-11	COIL, CHOKE 47uH		R406	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
L905	1-424-105-11	COIL, CHOKE 22uH		R407	1-216-837-11	METAL CHIP 22K 5% 1/16W	
L906	1-412-027-11	INDUCTOR, CHIP 2.2uH		R408	1-216-837-11	METAL CHIP 22K 5% 1/16W	
L907	1-412-029-11	INDUCTOR, CHIP 10uH		R409	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
L908	1-412-029-11	INDUCTOR, CHIP 10uH		R410	1-216-821-11	METAL CHIP 1K 5% 1/16W	
L909	1-412-029-11	INDUCTOR, CHIP 10uH		R411	1-216-821-11	METAL CHIP 1K 5% 1/16W	
< IC LINK >				R412	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
PS501	1-532-605-00	LINK, IC 0.4A		R413	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
				R414	1-216-837-11	METAL CHIP 22K 5% 1/16W	
				R415	1-216-837-11	METAL CHIP 22K 5% 1/16W	
				R416	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
				R501	1-216-851-11	METAL CHIP 330K 5% 1/16W	
				R502	1-216-849-11	METAL CHIP 220K 5% 1/16W	
				R503	1-216-841-11	METAL CHIP 47K 5% 1/16W	

Ref. No.	Part No.	Description	Remark				Ref. No.	Part No.	Description	Remark			
R504	1-216-833-11	METAL CHIP	10K	5%	1/16W		R558	1-216-691-11	METAL CHIP	47K	0.5%	1/10W	
R506	1-216-845-11	METAL CHIP	100K	5%	1/16W		R559	1-216-691-11	METAL CHIP	47K	0.5%	1/10W	
R507	1-216-833-11	METAL CHIP	10K	5%	1/16W		R560	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R508	1-216-833-11	METAL CHIP	10K	5%	1/16W		R561	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R510	1-216-845-11	METAL CHIP	100K	5%	1/16W		R562	1-216-813-11	METAL CHIP	220	5%	1/16W	
							R563	1-216-789-11	METAL CHIP	2.2	5%	1/16W	
R511	1-216-833-11	METAL CHIP	10K	5%	1/16W								
R512	1-216-833-11	METAL CHIP	10K	5%	1/16W		R564	1-216-789-11	METAL CHIP	2.2	5%	1/16W	
R513	1-216-827-11	METAL CHIP	3.3K	5%	1/16W		R565	1-216-789-11	METAL CHIP	2.2	5%	1/16W	
R514	1-216-833-11	METAL CHIP	10K	5%	1/16W		R566	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R515	1-216-827-11	METAL CHIP	3.3K	5%	1/16W		R567	1-216-833-11	METAL CHIP	10K	5%	1/16W	
							R568	1-216-817-11	METAL CHIP	470	5%	1/16W	
R516	1-216-833-11	METAL CHIP	10K	5%	1/16W								
R517	1-216-851-11	METAL CHIP	330K	5%	1/16W		R569	1-216-817-11	METAL CHIP	470	5%	1/16W	
R518	1-216-841-11	METAL CHIP	47K	5%	1/16W		R571	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R519	1-216-827-11	METAL CHIP	3.3K	5%	1/16W		R572	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R520	1-216-833-11	METAL CHIP	10K	5%	1/16W		R573	1-216-841-11	METAL CHIP	47K	5%	1/16W	
							R574	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R521	1-216-845-11	METAL CHIP	100K	5%	1/16W								
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W		R575	1-216-817-11	METAL CHIP	470	5%	1/16W	
R523	1-216-845-11	METAL CHIP	100K	5%	1/16W		R576	1-216-813-11	METAL CHIP	220	5%	1/16W	
R524	1-216-833-11	METAL CHIP	10K	5%	1/16W		R577	1-216-811-11	METAL CHIP	150	5%	1/16W	
R525	1-216-845-11	METAL CHIP	100K	5%	1/16W		R578	1-216-817-11	METAL CHIP	470	5%	1/16W	
							R579	1-216-803-11	METAL CHIP	33	5%	1/16W	
R526	1-216-833-11	METAL CHIP	10K	5%	1/16W								
R527	1-216-845-11	METAL CHIP	100K	5%	1/16W		R582	1-216-864-11	METAL CHIP	0			
R528	1-216-833-11	METAL CHIP	10K	5%	1/16W		R583	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R529	1-216-845-11	METAL CHIP	100K	5%	1/16W		R586	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R530	1-216-833-11	METAL CHIP	10K	5%	1/16W		R587	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
							R589	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R531	1-216-845-11	METAL CHIP	100K	5%	1/16W								
R532	1-216-829-11	METAL CHIP	4.7K	5%	1/16W		R590	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R534	1-216-845-11	METAL CHIP	100K	5%	1/16W		R591	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R535	1-216-843-11	METAL CHIP	68K	5%	1/16W		R592	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R536	1-216-857-11	METAL CHIP	1M	5%	1/16W		R594	1-216-835-11	METAL CHIP	15K	5%	1/16W	
							R595	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R537	1-216-833-11	METAL CHIP	10K	5%	1/16W								
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W		R596	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R539	1-216-833-11	METAL CHIP	10K	5%	1/16W		R597	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R540	1-216-845-11	METAL CHIP	100K	5%	1/16W		R598	1-216-809-11	METAL CHIP	100	5%	1/16W	
R541	1-216-833-11	METAL CHIP	10K	5%	1/16W		R599	1-216-809-11	METAL CHIP	100	5%	1/16W	
							R600	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R542	1-216-837-11	METAL CHIP	22K	5%	1/16W								
R543	1-216-829-11	METAL CHIP	4.7K	5%	1/16W		R601	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R544	1-216-837-11	METAL CHIP	22K	5%	1/16W		R602	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R545	1-216-829-11	METAL CHIP	4.7K	5%	1/16W		R603	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R546	1-216-837-11	METAL CHIP	22K	5%	1/16W		R604	1-216-837-11	METAL CHIP	22K	5%	1/16W	
							R605	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R547	1-216-829-11	METAL CHIP	4.7K	5%	1/16W								
R548	1-217-671-11	METAL CHIP	1	5%	1/10W		R606	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R549	1-217-671-11	METAL CHIP	1	5%	1/10W		R607	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R550	1-217-671-11	METAL CHIP	1	5%	1/10W		R608	1-216-854-11	METAL CHIP	560K	5%	1/16W	
R551	1-217-671-11	METAL CHIP	1	5%	1/10W		R609	1-216-833-11	METAL CHIP	10K	5%	1/16W	
							R610	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R552	1-216-037-00	METAL CHIP	330	5%	1/10W								
R553	1-216-833-11	METAL CHIP	10K	5%	1/16W		R611	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R555	1-216-845-11	METAL CHIP	100K	5%	1/16W		R613	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R556	1-216-827-11	METAL CHIP	3.3K	5%	1/16W		R614	1-216-833-11	METAL CHIP	10K	5%	1/16W	

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Ref. No.	Part No.	Description			Remark
R615	1-216-851-11	METAL CHIP	330K	5%	1/16W
R616	1-216-857-11	METAL CHIP	1M	5%	1/16W
R618	1-216-847-11	METAL CHIP	150K	5%	1/16W
R619	1-216-837-11	METAL CHIP	22K	5%	1/16W
R620	1-216-837-11	METAL CHIP	22K	5%	1/16W
R621	1-216-857-11	METAL CHIP	1M	5%	1/16W
R622	1-216-821-11	METAL CHIP	1K	5%	1/16W
R623	1-216-833-11	METAL CHIP	10K	5%	1/16W
R624	1-216-833-11	METAL CHIP	10K	5%	1/16W
R625	1-216-845-11	METAL CHIP	100K	5%	1/16W
R626	1-216-833-11	METAL CHIP	10K	5%	1/16W
R627	1-216-833-11	METAL CHIP	10K	5%	1/16W
R628	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R629	1-216-182-00	METAL GLAZE	220	5%	1/8W
R630	1-216-182-00	METAL GLAZE	220	5%	1/8W
R631	1-216-815-11	METAL CHIP	330	5%	1/16W
R632	1-216-813-11	METAL CHIP	220	5%	1/16W
R689	1-216-841-11	METAL CHIP	47K	5%	1/16W
R714	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R715	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R716	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R717	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R719	1-216-841-11	METAL CHIP	47K	5%	1/16W
R720	1-216-841-11	METAL CHIP	47K	5%	1/16W
R726	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R727	1-216-833-11	METAL CHIP	10K	5%	1/16W
R728	1-216-821-11	METAL CHIP	1K	5%	1/16W
R730	1-216-837-11	METAL CHIP	22K	5%	1/16W
R735	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R761	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R762	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R763	1-216-837-11	METAL CHIP	22K	5%	1/16W
R764	1-216-857-11	METAL CHIP	1M	5%	1/16W
R765	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R810	1-216-841-11	METAL CHIP	47K	5%	1/16W
R811	1-216-821-11	METAL CHIP	1K	5%	1/16W
R812	1-216-821-11	METAL CHIP	1K	5%	1/16W
R813	1-216-821-11	METAL CHIP	1K	5%	1/16W
R840	1-216-296-00	METAL CHIP	0	5%	1/8W
R841	1-216-296-00	METAL CHIP	0	5%	1/8W
R842	1-216-296-00	METAL CHIP	0	5%	1/8W
R850	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R851	1-216-864-11	METAL CHIP	0		
R855	1-216-809-11	METAL CHIP	100	5%	1/16W
R857	1-216-861-11	METAL CHIP	2.2M	5%	1/16W
R901	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R902	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R903	1-216-829-11	METAL CHIP	4.7K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R904	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R905	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R906	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R907	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R908	1-216-166-00	METAL GLAZE	47	5%	1/8W
R909	1-216-166-00	METAL GLAZE	47	5%	1/8W
R910	1-216-164-00	METAL GLAZE	39	5%	1/8W
R911	1-216-845-11	METAL CHIP	100K	5%	1/16W
R912	1-216-833-11	METAL CHIP	10K	5%	1/16W
R913	1-216-813-11	METAL CHIP	220	5%	1/16W
R914	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R915	1-216-833-11	METAL CHIP	10K	5%	1/16W
R916	1-216-833-11	METAL CHIP	10K	5%	1/16W
R924	1-216-821-11	METAL CHIP	1K	5%	1/16W
R927	1-216-833-11	METAL CHIP	10K	5%	1/16W

< VARIABLE RESISTOR >

RV901	1-238-089-11	RES. ADJ CERMET 4.7K
RV902	1-238-087-11	RES. ADJ CERMET 1K

< FLEXIBLE BOARD >

W510	1-633-923-11	FP-252 FLEXIBLE BOARD
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< VIBRATOR >

X501	1-577-467-21	VIBRATOR, CRYSTAL (16MHz)
X502	1-567-827-11	VIBRATOR, CRYSTAL

* A-7071-428-A SW-175P BOARD, COMPLETE

(Ref. No 2, 000 Series)

< CONNECTOR >

CN930	* 1-566-761-11	PIN, CONNECTOR (PC BOARD) 6P
CN931	1-575-846-11	CONNECTOR, FPC (NON ZIF) 5P

< DIODE >

D900	8-719-977-34	DIODE DTZ12
D901	8-719-977-34	DIODE DTZ12
D902	8-719-404-46	DIODE MA110
D903	8-719-977-34	DIODE DTZ12
D904	8-719-977-34	DIODE DTZ12
D905	8-719-404-46	DIODE MA110
D906	8-719-404-46	DIODE MA110
D907	8-719-404-46	DIODE MA110
D908	8-719-976-97	DIODE DTZ5.1

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Ref. No.	Part No.	Description	Remark
< JACK >			
J900	1-507-929-11	JACK (EARPHONE)	
J901	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	
< COIL >			
L900	1-410-369-11	INDUCTOR CHIP 1uH	
L901	1-410-369-11	INDUCTOR CHIP 1uH	
L902	1-410-369-11	INDUCTOR CHIP 1uH	
L903	1-410-192-51	INDUCTOR CHIP 1uH	
L904	1-410-369-11	INDUCTOR CHIP 1uH	
< TRANSISTOR >			
Q900	8-729-901-01	TRANSISTOR DTC144EK	
Q901	8-729-902-XX	TRANSISTOR DTC114TK	
< RESISTOR >			
R900	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R901	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R902	1-216-295-00	METAL CHIP 0 5% 1/10W	
R915	1-216-296-00	METAL CHIP 0 5% 1/8W	
< SWITCH >			
S900	1-570-870-11	SWITCH, SLIDE (STANDBY/LOCK)	
S901	1-571-838-11	SWITCH, TACTIL (START/STOP)	

* A-7062-780-A VA-70P BOARD, COMPLETE (AEP/UK)			

* A-7062-851-A VA-70PB BOARD, COMPLETE (AUS/E)			

(Ref. No 1,000 Series)			
3-719-695-01 SCREW (M1.7X3.5), SPECIAL HEAD			
3-744-842-01 SUPPORT, CT PC BOARD			
8-759-823-21 IC CXA-1536Q-L-E1			
< CAPACITOR >			
C002	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C071	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C072	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C101	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C102	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C103	1-163-035-00	CERAMIC CHIP 0.047uF 50V	
C104	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C105	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C108	1-162-958-11	CERAMIC CHIP 270PF 5% 50V	
C109	1-162-937-11	CERAMIC CHIP 6PF 0.5PF 50V	
C110	1-162-941-11	CERAMIC CHIP 10PF 0.5PF 50V	
C111	1-162-995-11	CERAMIC CHIP 0.022uF 50V	

Ref. No.	Part No.	Description	Remark
C112	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C113	1-162-942-11	CERAMIC CHIP 12PF 5% 50V	
C114	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C115	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C116	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C117	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C121	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C122	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C123	1-162-954-11	CERAMIC CHIP 120PF 5% 50V	
C125	1-164-458-11	CERAMIC CHIP 43PF 5% 50V	
C127	1-162-948-11	CERAMIC CHIP 39PF 5% 50V	
C129	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C131	1-162-955-11	CERAMIC CHIP 150PF 5% 50V	
C132	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C134	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C135	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C137	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C141	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C143	1-162-948-11	CERAMIC CHIP 39PF 5% 50V	
C144	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C145	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C146	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C147	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C181	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C182	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C183	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C201	1-162-959-11	CERAMIC CHIP 330PF 5% 50V	
C202	1-162-952-11	CERAMIC CHIP 82PF 5% 50V	
C203	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C204	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C205	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C206	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C207	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C208	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C209	1-126-154-11	ELECT 47uF 20% 6.3V	
C210	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C211	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C212	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C213	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C214	1-162-950-11	CERAMIC CHIP 56PF 5% 50V	
C215	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C216	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C217	1-162-954-11	CERAMIC CHIP 120PF 5% 50V	
C218	1-126-209-11	ELECT CHIP 100uF 20% 4V	
C219	1-162-955-11	CERAMIC CHIP 150PF 5% 50V	
C220	1-162-943-11	CERAMIC CHIP 15PF 5% 50V	
C221	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C222	1-162-948-11	CERAMIC CHIP 39PF 5% 50V	

VA-70P
VA-70PB

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C224	1-135-180-21	TANTALUM CHIP	3.3uF 20% 6.3V	C278	1-163-135-00	CERAMIC CHIP	560PF 5% 50V
C225	1-164-156-11	CERAMIC CHIP	0.1uF 25V	C279	1-162-958-11	CERAMIC CHIP	270PF 5% 50V
C226	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C280	1-162-957-11	CERAMIC CHIP	220PF 5% 50V
C227	1-135-180-21	TANTALUM CHIP	3.3uF 20% 6.3V	C284	1-128-004-11	ELECT CHIP	10uF 20% 16V
C228	1-163-038-00	CERAMIC CHIP	0.1uF 25V	C285	1-163-035-00	CERAMIC CHIP	0.047uF 50V
C229	1-135-180-21	TANTALUM CHIP	3.3uF 20% 6.3V	C286	1-162-974-11	CERAMIC CHIP	0.01uF 50V
C230	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C287	1-164-156-11	CERAMIC CHIP	0.1uF 25V
C231	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C288	1-128-292-11	ELECT	220uF 20% 10V
C232	1-162-638-11	CERAMIC CHIP	1uF 16V	C289	1-162-950-11	CERAMIC CHIP	56PF 5% 50V
C233	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C301	1-162-944-11	CERAMIC CHIP	18PF 5% 50V
C234	1-135-157-21	TANTALUM CHIP	10uF 20% 6.3V	C302	1-162-974-11	CERAMIC CHIP	0.01uF 50V
C235	1-128-004-11	ELECT CHIP	10uF 20% 16V	C303	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V
C236	1-162-950-11	CERAMIC CHIP	56PF 5% 50V	C305	1-162-945-11	CERAMIC CHIP	22PF 5% 50V
C237	1-128-004-11	ELECT CHIP	10uF 20% 16V	C306	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V
C238	1-162-953-11	CERAMIC CHIP	100PF 5% 50V	C307	1-128-004-11	ELECT CHIP	10uF 20% 16V
C239	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C308	1-162-995-11	CERAMIC CHIP	0.022uF 50V
C240	1-128-004-11	ELECT CHIP	10uF 20% 16V	C309	1-135-176-21	TANTALUM CHIP	0.68uF 10% 20V
C241	1-135-201-11	TANTALUM CHIP	10uF 20% 4V	C310	1-128-013-11	ELECT CHIP	1uF 20% 50V
C242	1-128-003-11	ELECT CHIP	22uF 20% 4V	C311	1-128-013-11	ELECT CHIP	1uF 20% 50V
C246	1-128-003-11	ELECT CHIP	22uF 20% 4V	C312	1-162-969-11	CERAMIC CHIP	0.0068uF 10% 25V
C247	1-164-005-11	CERAMIC CHIP	0.47uF 25V	C315	1-162-970-11	CERAMIC CHIP	0.01uF 10% 25V
C248	1-128-004-11	ELECT CHIP	10uF 20% 16V	C316	1-128-004-11	ELECT CHIP	10uF 20% 16V
C249	1-128-004-11	ELECT CHIP	10uF 20% 16V	C317	1-128-004-11	ELECT CHIP	10uF 20% 16V
C250	1-128-004-11	ELECT CHIP	10uF 20% 16V	C318	1-162-974-11	CERAMIC CHIP	0.01uF 50V
C251	1-128-004-11	ELECT CHIP	10uF 20% 16V	C319	1-164-217-11	CERAMIC CHIP	150PF 0.25PF 50V
C252	1-164-222-11	CERAMIC CHIP	0.22uF 25V	C320	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V
C253	1-164-005-11	CERAMIC CHIP	0.47uF 25V	C321	1-162-949-11	CERAMIC CHIP	47PF 5% 50V
C254	1-128-004-11	ELECT CHIP	10uF 20% 16V	C322	1-163-038-00	CERAMIC CHIP	0.1uF 25V
C255	1-128-006-11	ELECT CHIP	4.7uF 20% 25V	C323	1-162-952-11	CERAMIC CHIP	82PF 5% 50V
C256	1-126-246-11	ELECT CHIP	220uF 20% 4V	C324	1-162-967-11	CERAMIC CHIP	0.0033uF 10% 50V
C257	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C325	1-162-974-11	CERAMIC CHIP	0.01uF 50V
C258	1-128-004-11	ELECT CHIP	10uF 20% 16V	C326	1-162-954-11	CERAMIC CHIP	120PF 5% 50V
C259	1-163-023-00	CERAMIC CHIP	0.015uF 5% 50V	C327	1-162-951-11	CERAMIC CHIP	68PF 5% 50V
C261	1-124-779-00	ELECT CHIP	10uF 20% 16V	C328	1-162-950-11	CERAMIC CHIP	56PF 5% 50V
C262	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C329	1-162-953-11	CERAMIC CHIP	100PF 5% 50V
C263	1-126-207-11	ELECT CHIP	33uF 20% 4V	C330	1-162-974-11	CERAMIC CHIP	0.01uF 50V
C264	1-162-962-11	CERAMIC CHIP	470PF 10% 50V	C331	1-128-004-11	ELECT CHIP	10uF 20% 16V
C265	1-126-205-11	ELECT CHIP	47uF 20% 6.3V	C332	1-162-974-11	CERAMIC CHIP	0.01uF 50V
C266	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C333	1-162-941-11	CERAMIC CHIP	10PF 0.5PF 50V
C267	1-124-779-00	ELECT CHIP	10uF 20% 16V	C334	1-126-205-11	ELECT CHIP	47uF 20% 6.3V
C268	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C335	1-162-957-11	CERAMIC CHIP	220PF 5% 50V
C269	1-128-004-11	ELECT CHIP	10uF 20% 16V	C336	1-162-974-11	CERAMIC CHIP	0.01uF 50V
C270	1-163-129-00	CERAMIC CHIP	330PF 5% 50V	C337	1-162-974-11	CERAMIC CHIP	0.01uF 50V
C271	1-163-131-00	CERAMIC CHIP	390PF 5% 50V	C338	1-162-995-11	CERAMIC CHIP	0.022uF 50V
C273	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C339	1-162-974-11	CERAMIC CHIP	0.01uF 50V
C274	1-128-004-11	ELECT CHIP	10uF 20% 16V	C340	1-162-937-11	CERAMIC CHIP	6PF 0.5PF 50V
C275	1-162-974-11	CERAMIC CHIP	0.01uF 50V	C342	1-162-949-11	CERAMIC CHIP	47PF 5% 50V
C276	1-128-004-11	ELECT CHIP	10uF 20% 16V	C352	1-128-013-11	ELECT CHIP	1uF 20% 50V
C277	1-162-942-11	CERAMIC CHIP	12PF 5% 50V	C353	1-162-964-11	CERAMIC CHIP	0.001uF 10% 50V

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Ref. No.	Part No.	Description	Remark
C354	1-128-006-11	ELECT CHIP 4.7uF	20% 25V
C355	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C357	1-128-004-11	ELECT CHIP 10uF	20% 16V
C358	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C359	1-163-118-00	CERAMIC CHIP 110PF	5% 50V
C360	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C361	1-128-007-11	ELECT CHIP 2.2uF	20% 35V
C362	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C363	1-164-145-11	CERAMIC CHIP 390PF	5% 50V
C364	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C365	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C366	1-162-936-11	CERAMIC CHIP 5PF	0.25PF 50V
C367	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C368	1-162-943-11	CERAMIC CHIP 15PF	5% 50V
C370	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C371	1-162-921-11	CERAMIC CHIP 33PF	5% 50V
C402	1-162-971-11	CERAMIC CHIP 0.001uF	50V
C403	1-162-971-11	CERAMIC CHIP 0.001uF	50V
C404	1-162-971-11	CERAMIC CHIP 0.001uF	50V
C405	1-162-971-11	CERAMIC CHIP 0.001uF	50V
C406	1-164-489-11	CERAMIC CHIP 0.22uF	10% 16V
C407	1-128-006-11	ELECT CHIP 4.7uF	20% 25V
C408	1-126-207-11	ELECT CHIP 33uF	20% 4V
C409	1-128-006-11	ELECT CHIP 4.7uF	20% 25V
C411	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C412	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C414	1-126-206-11	ELECT CHIP 100uF	20% 6.3V
C416	1-163-809-11	CERAMIC CHIP 0.047uF	10% 25V
C417	1-163-989-11	CERAMIC CHIP 0.033uF	10% 25V
C418	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C419	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C421	1-162-965-11	CERAMIC CHIP 0.0015uF	10% 50V
C422	1-162-638-11	CERAMIC CHIP 1uF	16V
C423	1-162-949-11	CERAMIC CHIP 47PF	5% 50V
C424	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C427	1-162-969-11	CERAMIC CHIP 0.0068uF	10% 25V
C429	1-128-013-11	ELECT CHIP 1uF	20% 50V
C430	1-126-607-11	ELECT CHIP 47uF	20% 4V
C431	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C432	1-128-003-11	ELECT CHIP 22uF	20% 4V
C433	1-128-003-11	ELECT CHIP 22uF	20% 4V
C434	1-128-004-11	ELECT CHIP 10uF	20% 16V
C435	1-128-013-11	ELECT CHIP 1uF	20% 50V
C436	1-128-006-11	ELECT CHIP 4.7uF	20% 25V
C437	1-162-957-11	CERAMIC CHIP 220PF	5% 50V
C438	1-128-013-11	ELECT CHIP 1uF	20% 50V
C439	1-162-638-11	CERAMIC CHIP 1uF	16V
C440	1-128-013-11	ELECT CHIP 1uF	20% 50V

Ref. No.	Part No.	Description	Remark
C441	1-162-637-11	CERAMIC CHIP 0.47uF	50V
C442	1-164-227-11	CERAMIC CHIP 0.022uF	10% 25V
C443	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C445	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C446	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C448	1-162-949-11	CERAMIC CHIP 47PF	5% 50V
C449	1-162-638-11	CERAMIC CHIP 1uF	16V
C450	1-162-971-11	CERAMIC CHIP 0.001uF	50V
C451	1-128-006-11	ELECT CHIP 4.7uF	20% 25V
C453	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C454	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C456	1-126-206-11	ELECT CHIP 100uF	20% 6.3V
C458	1-163-809-11	CERAMIC CHIP 0.047uF	10% 25V
C459	1-163-989-11	CERAMIC CHIP 0.033uF	10% 25V
C460	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C461	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C462	1-162-638-11	CERAMIC CHIP 1uF	16V
C463	1-162-965-11	CERAMIC CHIP 0.0015uF	10% 50V
C466	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C468	1-162-957-11	CERAMIC CHIP 220PF	5% 50V
C469	1-162-966-11	CERAMIC CHIP 0.0022uF	10% 50V
C470	1-162-969-11	CERAMIC CHIP 0.0068uF	10% 25V
C472	1-128-013-11	ELECT CHIP 1uF	20% 50V
C473	1-126-607-11	ELECT CHIP 47uF	20% 4V
C474	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C475	1-128-003-11	ELECT CHIP 22uF	20% 4V
C476	1-128-003-11	ELECT CHIP 22uF	20% 4V
C477	1-162-966-11	CERAMIC CHIP 0.0022uF	10% 50V
C478	1-128-004-11	ELECT CHIP 10uF	20% 16V
C479	1-128-013-11	ELECT CHIP 1uF	20% 50V
C480	1-128-006-11	ELECT CHIP 4.7uF	20% 25V
C481	1-162-957-11	CERAMIC CHIP 220PF	5% 50V
C482	1-128-013-11	ELECT CHIP 1uF	20% 50V
C483	1-128-013-11	ELECT CHIP 1uF	20% 50V
C484	1-128-013-11	ELECT CHIP 1uF	20% 50V
C485	1-162-637-11	CERAMIC CHIP 0.47uF	16V
C486	1-164-489-11	CERAMIC CHIP 0.22uF	10% 16V
C487	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C488	1-128-006-11	ELECT CHIP 4.7uF	20% 25V
C490	1-128-006-11	ELECT CHIP 4.7uF	20% 25V
C491	1-162-971-11	CERAMIC CHIP 0.001uF	50V
C492	1-124-778-00	ELECT CHIP 22uF	20% 6.3V
C493	1-162-638-11	CERAMIC CHIP 1uF	16V
C494	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C495	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V
C601	1-162-951-11	CERAMIC CHIP 68PF	5% 50V
C610	1-162-968-11	CERAMIC CHIP 0.0047uF	10% 50V
C611	1-162-968-11	CERAMIC CHIP 0.0047uF	10% 50V
C616	1-164-634-11	CERAMIC CHIP 1uF	16V

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Ref. No.	Part No.	Description	Remark
C617	1-164-634-11	CERAMIC CHIP 1uF	16V
< FILTER >			
CF301	1-577-162-11	FILTER, CERAMIC	
< CONNECTOR >			
CN401	* 1-566-761-11	PIN, CONNECTOR (PC BOARD) 6P	
CN506	1-569-486-11	CONNECTOR, BOARD TO BOARD 16P	
CN507	1-569-485-11	CONNECTOR, BOARD TO BOARD 20P	
CN508	1-569-478-21	CONNECTOR, FPC 20P	
CN601	* 1-566-764-11	PIN, CONNECTOR (PC BOARD) 9P	
CN703	1-568-359-41	CONNECTOR, BOARD TO BOARD 20P	
CN704	1-569-363-21	CONNECTOR, FPC 15P	
CN901	1-566-524-21	CONNECTOR, FPC (ZIF) 8P	
< DIODE >			
D101	8-719-800-76	DIODE 1SS226	
D202	8-719-941-86	DIODE DAN202U	
D203	8-719-941-86	DIODE DAN202U	
D204	8-719-404-46	DIODE MA110	
D205	8-719-941-86	DIODE DAN202U	
D207	8-719-941-86	DIODE DAN202U	
D208	8-719-941-86	DIODE DAN202U	
D209	8-719-941-86	DIODE DAN202U	
D210	8-719-404-46	DIODE MA110	
D214	8-719-940-45	DIODE MA159	
D215	8-719-404-46	DIODE MA110	
D216	8-719-404-46	DIODE MA110	
D217	8-719-800-76	DIODE 1SS226	
D219	8-719-941-86	DIODE DAN202U	
D351	8-719-404-46	DIODE MA110	
D400	8-719-941-86	DIODE DAN202U	
D401	8-719-941-86	DIODE DAN202U	
D402	8-719-404-46	DIODE MA110	
< FILTER >			
FL201	1-236-751-21	FILTER, LOW PASS	
FL202	1-415-764-21	DELAY LINE, LC	
FL203	1-236-848-21	FILTER, LOW PASS	
FL204	1-415-818-11	DELAY LINE, LC (Y)	
FL205	1-239-055-21	FILTER, LOW PASS (CCD, PAL, Y)	
FL301	1-236-849-21	FILTER, BAND PASS	
FL302	1-236-186-11	FILTER, BAND PASS	
FL303	1-236-850-21	FILTER, BAND PASS	
< IC >			
IC001	8-759-999-02	IC TL1596CDSB	
IC101	8-759-012-00	IC MC10H116M	

Ref. No.	Part No.	Description	Remark
IC201	8-752-036-19	IC CXA1207R	
IC202	8-752-333-24	IC CXL1506M	
IC203	8-752-036-20	IC CXA1208R	
IC204	8-759-605-61	IC CXA1203N	
IC205	8-759-710-29	IC NJM2235M	
IC206	8-759-320-76	IC HA118070FPTR	
IC207	8-759-711-71	IC NJM2234M	
IC400	8-759-823-19	IC CXA-1488R	
IC401	8-759-823-19	IC CXA-1536Q	
IC402	8-759-823-19	IC CXA-1488R	
IC403	8-759-603-27	IC M5201FP	
IC405	8-759-009-22	IC MC14094BF	
< JACK >			
J201	1-569-556-11	JACK (AUDIO/VIDEO IN/OUT)	
< COIL >			
L101	1-412-032-11	INDUCTOR CHIP 100uH	
L102	1-412-280-31	INDUCTOR 330uH	
L103	1-410-167-41	INDUCTOR CHIP 820uH	
L105	1-410-657-21	INDUCTOR CHIP 180uH	
L106	1-410-387-11	INDUCTOR CHIP 33uH	
L109	1-410-381-11	INDUCTOR CHIP 10uH	
L110	1-410-658-31	INDUCTOR CHIP 220uH	
L122	1-410-658-31	INDUCTOR CHIP 220uH	
L124	1-412-280-31	INDUCTOR 330uH	
L125	1-410-380-31	INDUCTOR CHIP 8.2uH	
L126	1-412-032-11	INDUCTOR CHIP 100uH	
L129	1-412-026-11	INDUCTOR CHIP 1uH	
L181	1-412-026-11	INDUCTOR CHIP 1uH	
L201	1-410-390-11	INDUCTOR CHIP 56uH	
L202	1-410-386-11	INDUCTOR CHIP 27uH	
L203	1-410-370-31	INDUCTOR CHIP 1.2uH	
L204	1-410-392-11	INDUCTOR CHIP 82uH	
L205	1-412-031-11	INDUCTOR CHIP 47uH	
L206	1-412-031-11	INDUCTOR CHIP 47uH	
L209	1-412-031-11	INDUCTOR CHIP 47uH	
L210	1-410-393-11	INDUCTOR CHIP 100uH	
L211	1-410-375-11	INDUCTOR CHIP 3.3uH	
L212	1-410-379-21	INDUCTOR CHIP 6.8uH	
L214	1-410-377-31	INDUCTOR CHIP 4.7uH	
L301	1-410-393-11	INDUCTOR CHIP 100uH	
L302	1-410-386-11	INDUCTOR CHIP 27uH	
L304	1-410-393-11	INDUCTOR CHIP 100uH	
L305	1-410-393-11	INDUCTOR CHIP 100uH	
L306	1-410-655-31	INDUCTOR CHIP 120uH	
L307	1-410-656-11	INDUCTOR CHIP 150uH	
L309	1-410-379-21	INDUCTOR CHIP 6.8uH	

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Ref. No.	Part No.	Description	Remark
< TRANSISTOR >			
Q001	8-729-905-23	TRANSISTOR 2SA1576	
Q002	8-729-905-35	TRANSISTOR 2SC4081	
Q004	8-729-905-35	TRANSISTOR 2SC4081	
Q005	8-729-905-35	TRANSISTOR 2SC4081	
Q060	8-729-905-18	TRANSISTOR DTC144EU	
Q061	8-729-905-18	TRANSISTOR DTC144EU	
Q062	8-729-905-18	TRANSISTOR DTC144EU	
Q063	8-729-905-12	TRANSISTOR DTA144EU	
Q101	8-729-905-23	TRANSISTOR 2SA1576	
Q102	8-729-905-18	TRANSISTOR DTC144EU	
Q105	8-729-905-35	TRANSISTOR 2SC4081	
Q106	8-729-102-07	TRANSISTOR 2SC2223	
Q107	8-729-905-12	TRANSISTOR DTA144EU	
Q109	8-729-905-35	TRANSISTOR 2SC4081	
Q115	8-729-905-35	TRANSISTOR 2SC4081	
Q116	8-729-905-18	TRANSISTOR DTC144EU	
Q117	8-729-905-35	TRANSISTOR 2SC4081	
Q118	8-729-905-23	TRANSISTOR 2SA1576	
Q119	8-729-905-35	TRANSISTOR 2SC4081	
Q121	8-729-141-48	TRANSISTOR 2SB624T1-BV345	
Q122	8-729-102-07	TRANSISTOR 2SC2223	
Q123	8-729-905-35	TRANSISTOR 2SC4081	
Q130	8-729-905-35	TRANSISTOR 2SC4081	
Q131	8-729-905-23	TRANSISTOR 2SA1576	
Q140	8-729-905-12	TRANSISTOR DTA144EU	
Q141	8-729-905-35	TRANSISTOR 2SC4081	
Q142	8-729-101-07	TRANSISTOR 2SB798-DLDC	
Q154	8-729-905-35	TRANSISTOR 2SC4081	
Q171	8-729-905-35	TRANSISTOR 2SC4081	
Q172	8-729-905-35	TRANSISTOR 2SC4081	
Q191	8-729-905-35	TRANSISTOR 2SC4081	
Q192	8-729-905-18	TRANSISTOR DTC144EU	
Q195	8-729-905-12	TRANSISTOR DTA144EU	
Q196	8-729-905-18	TRANSISTOR DTC144EU	
Q201	8-729-905-35	TRANSISTOR 2SC4081	
Q202	8-729-905-12	TRANSISTOR DTA144EU	
Q203	8-729-905-23	TRANSISTOR 2SA1576	
Q204	8-729-905-35	TRANSISTOR 2SC4081	
Q205	8-729-905-18	TRANSISTOR DTC144EU	
Q206	8-729-905-35	TRANSISTOR 2SC4081	
Q209	8-729-905-18	TRANSISTOR DTC144EU	
Q210	8-729-905-23	TRANSISTOR 2SA1576	
Q211	8-729-905-35	TRANSISTOR 2SC4081	
Q212	8-729-905-35	TRANSISTOR 2SC4081	
Q215	8-729-905-23	TRANSISTOR 2SA1576	
Q216	8-729-905-18	TRANSISTOR DTC144EU	
Q220	8-729-141-48	TRANSISTOR 2SB624T1-BV345	

Ref. No.	Part No.	Description	Remark
Q221	8-729-905-18	TRANSISTOR DTC144EU	
Q222	8-729-905-12	TRANSISTOR DTA144EU	
Q223	8-729-905-35	TRANSISTOR 2SC4081	
Q224	8-729-905-35	TRANSISTOR 2SC4081	
Q225	8-729-905-12	TRANSISTOR DTA144EU	
Q226	8-729-905-35	TRANSISTOR 2SC4081	
Q227	8-729-905-35	TRANSISTOR 2SC4081	
Q228	8-729-905-23	TRANSISTOR 2SA1576	
Q229	8-729-905-35	TRANSISTOR 2SC4081	
Q231	8-729-905-35	TRANSISTOR 2SC4081	
Q232	8-729-905-35	TRANSISTOR 2SC4081	
Q238	8-729-905-23	TRANSISTOR 2SA1576	
Q240	8-729-905-35	TRANSISTOR 2SC4081	
Q241	8-729-905-23	TRANSISTOR 2SA1576	
Q244	8-729-905-18	TRANSISTOR DTC144EU	
Q245	8-729-905-XX	TRANSISTOR DTC114TU	
Q246	8-729-905-XX	TRANSISTOR DTC114TU	
Q247	8-729-905-XX	TRANSISTOR DTC114TU	
Q248	8-729-905-18	TRANSISTOR DTC144EU	
Q250	8-729-905-35	TRANSISTOR 2SC4081	
Q251	8-729-905-18	TRANSISTOR DTC144EU	
Q252	8-729-905-18	TRANSISTOR DTC144EU	
Q254	8-729-905-35	TRANSISTOR 2SC4081	
Q301	8-729-905-23	TRANSISTOR 2SA1576	
Q303	8-729-905-35	TRANSISTOR 2SC4081	
Q304	8-729-905-35	TRANSISTOR 2SC4081	
Q306	8-729-905-35	TRANSISTOR 2SC4081	
Q307	8-729-905-18	TRANSISTOR DTC144EU	
Q310	8-729-905-35	TRANSISTOR 2SC4081	
Q311	8-729-905-35	TRANSISTOR 2SC4081	
Q351	8-729-905-35	TRANSISTOR 2SC4081	
Q352	8-729-905-35	TRANSISTOR 2SC4081	
Q353	8-729-905-35	TRANSISTOR 2SC4081	
Q354	8-729-905-35	TRANSISTOR 2SC4081	
Q356	8-729-905-18	TRANSISTOR DTC144EU	
Q357	8-729-905-12	TRANSISTOR DTA144EU	
Q358	8-729-905-18	TRANSISTOR DTC144EU	
Q359	8-729-102-08	TRANSISTOR 2SC2223-F14	
Q360	8-729-905-18	TRANSISTOR DTC144EU	
Q362	8-729-905-18	TRANSISTOR DTC144EU	
Q400	8-729-905-18	TRANSISTOR DTC144EU	
Q401	8-729-905-18	TRANSISTOR DTC144EU	
Q402	8-729-905-35	TRANSISTOR 2SC4081	
Q403	8-729-904-07	TRANSISTOR FMG2	
Q404	8-729-904-07	TRANSISTOR FMG2	
Q405	8-729-905-18	TRANSISTOR DTC144EU	
Q406	8-729-905-18	TRANSISTOR DTC144EU	
Q407	8-729-905-XX	TRANSISTOR DTC114TU	

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Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
Q408	8-729-905-XX	TRANSISTOR	DTC114TU	R071	1-216-661-11	METAL CHIP	2.7K 0.5% 1/10W
Q409	8-729-216-22	TRANSISTOR	2SA1162	R072	1-216-833-11	METAL CHIP	10K 5% 1/16W
Q410	8-729-907-39	TRANSISTOR	1MD2T	R073	1-216-833-11	METAL CHIP	10K 5% 1/16W
Q412	8-729-402-81	TRANSISTOR	XN4501	R074	1-216-809-11	METAL CHIP	100 5% 1/16W
Q413	8-729-905-18	TRANSISTOR	DTC144EU	R076	1-216-864-11	METAL CHIP	0
Q414	8-729-904-07	TRANSISTOR	FMG2	R087	1-216-831-11	METAL CHIP	6.8K 5% 1/16W
Q415	8-729-905-23	TRANSISTOR	2SA1576R	R088	1-216-821-11	METAL CHIP	1K 5% 1/16W
< RESISTOR >				R089	1-216-838-11	METAL CHIP	27K 5% 1/16W
R001	1-216-839-11	METAL CHIP	33K 5% 1/16W	R090	1-216-833-11	METAL CHIP	10K 5% 1/16W
R002	1-216-842-11	METAL CHIP	56K 5% 1/16W	R092	1-216-826-11	METAL CHIP	2.7K 5% 1/16W
R003	1-216-817-11	METAL CHIP	470 5% 1/16W	R093	1-216-838-11	METAL CHIP	27K 5% 1/16W
R004	1-216-821-11	METAL CHIP	1K 5% 1/16W	R097	1-216-845-11	METAL CHIP	100K 5% 1/16W
R005	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R099	1-216-833-11	METAL CHIP	10K 5% 1/16W
R006	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R101	1-216-833-11	METAL CHIP	10K 5% 1/16W
R011	1-216-826-11	METAL CHIP	2.7K 5% 1/16W	R102	1-216-833-11	METAL CHIP	10K 5% 1/16W
R012	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R103	1-216-821-11	METAL CHIP	1K 5% 1/16W
R015	1-216-809-11	METAL CHIP	100 5% 1/16W	R104	1-216-811-11	METAL CHIP	150 5% 1/16W
R016	1-216-813-11	METAL CHIP	220 5% 1/16W	R108	1-216-837-11	METAL CHIP	22K 5% 1/16W
R017	1-216-816-11	METAL CHIP	390 5% 1/16W	R109	1-216-839-11	METAL CHIP	33K 5% 1/16W
R018	1-216-814-11	METAL CHIP	270 5% 1/16W	R110	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
R020	1-216-818-11	METAL CHIP	560 5% 1/16W	R111	1-216-819-11	METAL CHIP	680 5% 1/16W
R021	1-216-819-11	METAL CHIP	680 5% 1/16W	R112	1-216-826-11	METAL CHIP	2.7K 5% 1/16W
R025	1-216-821-11	METAL CHIP	1K 5% 1/16W	R113	1-216-814-11	METAL CHIP	270 5% 1/16W
R032	1-216-864-11	METAL CHIP	0	R114	1-216-834-11	METAL CHIP	12K 5% 1/16W
R035	1-216-833-11	METAL CHIP	10K 5% 1/16W	R115	1-216-833-11	METAL CHIP	10K 5% 1/16W
R036	1-216-824-11	METAL CHIP	1.8K 5% 1/16W	R116	1-216-817-11	METAL CHIP	470 5% 1/16W
R037	1-216-826-11	METAL CHIP	2.7K 5% 1/16W	R117	1-216-808-11	METAL CHIP	82 5% 1/16W
R041	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R118	1-216-832-11	METAL CHIP	8.2K 5% 1/16W
R042	1-216-824-11	METAL CHIP	1.8K 5% 1/16W	R119	1-216-823-11	METAL CHIP	1.5K 5% 1/16W
R043	1-216-839-11	METAL CHIP	33K 5% 1/16W	R120	1-216-824-11	METAL CHIP	1.8K 5% 1/16W
R044	1-216-837-11	METAL CHIP	22K 5% 1/16W	R124	1-216-821-11	METAL CHIP	1K 5% 1/16W
R045	1-216-821-11	METAL CHIP	1K 5% 1/16W	R125	1-216-836-11	METAL CHIP	18K 5% 1/16W
R047	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R126	1-216-836-11	METAL CHIP	18K 5% 1/16W
R048	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R127	1-216-821-11	METAL CHIP	1K 5% 1/16W
R049	1-216-821-11	METAL CHIP	1K 5% 1/16W	R128	1-216-864-11	METAL CHIP	0
R050	1-216-825-11	METAL CHIP	2.2K 5% 1/16W	R131	1-216-837-11	METAL CHIP	22K 5% 1/16W
R051	1-216-833-11	METAL CHIP	10K 5% 1/16W	R132	1-216-837-11	METAL CHIP	22K 5% 1/16W
R052	1-216-841-11	METAL CHIP	47K 5% 1/16W	R133	1-216-817-11	METAL CHIP	470 5% 1/16W
R053	1-216-821-11	METAL CHIP	1K 5% 1/16W	R134	1-216-817-11	METAL CHIP	470 5% 1/16W
R054	1-216-837-11	METAL CHIP	22K 5% 1/16W	R138	1-216-864-11	METAL CHIP	0
R055	1-216-826-11	METAL CHIP	2.7K 5% 1/16W	R140	1-216-824-11	METAL CHIP	1.8K 5% 1/16W
R056	1-216-834-11	METAL CHIP	12K 5% 1/16W	R141	1-216-817-11	METAL CHIP	470 5% 1/16W
R060	1-216-864-11	METAL CHIP	0	R142	1-216-817-11	METAL CHIP	470 5% 1/16W
R061	1-216-821-11	METAL CHIP	1K 5% 1/16W	R143	1-216-817-11	METAL CHIP	470 5% 1/16W
R062	1-216-847-11	METAL CHIP	150K 5% 1/16W	R144	1-216-821-11	METAL CHIP	1K 5% 1/16W
R063	1-216-847-11	METAL CHIP	150K 5% 1/16W	R146	1-216-817-11	METAL CHIP	470 5% 1/16W
R065	1-216-817-11	METAL CHIP	470 5% 1/16W	R147	1-216-821-11	METAL CHIP	1K 5% 1/16W
R066	1-216-809-11	METAL CHIP	100 5% 1/16W	R148	1-216-821-11	METAL CHIP	1K 5% 1/16W
				R149	1-216-821-11	METAL CHIP	1K 5% 1/16W

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Ref. No.	Part No.	Description	Remark		
R150	1-216-821-11	METAL CHIP	1K	5%	1/16W
R151	1-216-821-11	METAL CHIP	1K	5%	1/16W
R152	1-216-821-11	METAL CHIP	1K	5%	1/16W
R153	1-216-821-11	METAL CHIP	1K	5%	1/16W
R154	1-216-821-11	METAL CHIP	1K	5%	1/16W
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W
R158	1-216-818-11	METAL CHIP	560	5%	1/16W
R159	1-216-837-11	METAL CHIP	22K	5%	1/16W
R160	1-216-837-11	METAL CHIP	22K	5%	1/16W
R161	1-216-817-11	METAL CHIP	470	5%	1/16W
R162	1-216-817-11	METAL CHIP	470	5%	1/16W
R163	1-216-805-11	METAL CHIP	47	5%	1/16W
R164	1-216-817-11	METAL CHIP	470	5%	1/16W
R165	1-216-813-11	METAL CHIP	220	5%	1/16W
R166	1-216-821-11	METAL CHIP	1K	5%	1/16W
R167	1-216-833-11	METAL CHIP	10K	5%	1/16W
R168	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R170	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R171	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R173	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R174	1-216-864-11	METAL CHIP	0		
R175	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R176	1-216-833-11	METAL CHIP	10K	5%	1/16W
R178	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R181	1-216-804-11	METAL CHIP	39	5%	1/16W
R182	1-216-804-11	METAL CHIP	39	5%	1/16W
R183	1-216-807-11	METAL CHIP	68	5%	1/16W
R184	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R185	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R186	1-216-836-11	METAL CHIP	18K	5%	1/16W
R187	1-216-820-11	METAL CHIP	820	5%	1/16W
R188	1-216-833-11	METAL CHIP	10K	5%	1/16W
R191	1-216-841-11	METAL CHIP	47K	5%	1/16W
R192	1-216-841-11	METAL CHIP	47K	5%	1/16W
R193	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R196	1-216-864-11	METAL CHIP	0		
R201	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R202	1-216-841-11	METAL CHIP	47K	5%	1/16W
R203	1-216-810-11	METAL CHIP	120	5%	1/16W
R204	1-216-821-11	METAL CHIP	1K	5%	1/16W
R206	1-216-821-11	METAL CHIP	1K	5%	1/16W
R208	1-216-816-11	METAL CHIP	390	5%	1/16W
R209	1-216-819-11	METAL CHIP	680	5%	1/16W
R210	1-216-814-11	METAL CHIP	270	5%	1/16W
R211	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R212	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R213	1-216-817-11	METAL CHIP	470	5%	1/16W
R214	1-216-820-11	METAL CHIP	820	5%	1/16W
R215	1-216-817-11	METAL CHIP	470	5%	1/16W

Ref. No.	Part No.	Description	Remark		
R216	1-216-817-11	METAL CHIP	470	5%	1/16W
R219	1-216-833-11	METAL CHIP	10K	5%	1/16W
R220	1-216-810-11	METAL CHIP	120	5%	1/16W
R221	1-216-844-11	METAL CHIP	82K	5%	1/16W
R222	1-216-857-11	METAL CHIP	1M	5%	1/16W
R225	1-216-839-11	METAL CHIP	33K	5%	1/16W
R226	1-216-817-11	METAL CHIP	470	5%	1/16W
R227	1-216-049-00	METAL CHIP	1K	5%	1/10W
R228	1-216-842-11	METAL CHIP	56K	5%	1/16W
R229	1-216-821-11	METAL CHIP	1K	5%	1/16W
R230	1-216-838-11	METAL CHIP	27K	5%	1/16W
R231	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R232	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R233	1-216-821-11	METAL CHIP	1K	5%	1/16W
R234	1-216-821-11	METAL CHIP	1K	5%	1/16W
R235	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R236	1-216-821-11	METAL CHIP	1K	5%	1/16W
R237	1-216-821-11	METAL CHIP	1K	5%	1/16W
R239	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R241	1-216-833-11	METAL CHIP	10K	5%	1/16W
R242	1-216-864-11	METAL CHIP	0		
R244	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R245	1-216-833-11	METAL CHIP	10K	5%	1/16W
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W
R248	1-216-841-11	METAL CHIP	47K	5%	1/16W
R249	1-216-821-11	METAL CHIP	1K	5%	1/16W
R250	1-216-821-11	METAL CHIP	1K	5%	1/16W
R251	1-216-845-11	METAL CHIP	100K	5%	1/16W
R252	1-216-853-11	METAL CHIP	470K	5%	1/16W
R255	1-216-833-11	METAL CHIP	10K	5%	1/16W
R256	1-216-833-11	METAL CHIP	10K	5%	1/16W
R257	1-216-821-11	METAL CHIP	1K	5%	1/16W
R258	1-216-821-11	METAL CHIP	1K	5%	1/16W
R259	1-216-833-11	METAL CHIP	10K	5%	1/16W
R260	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R261	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R262	1-216-832-11	METAL CHIP	8.2K	5%	1/10W
R263	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R265	1-216-643-11	METAL CHIP	470	0.5%	1/16W
R267	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R268	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R269	1-218-688-11	METAL CHIP	680	0.50%	1/16W
R270	1-218-706-11	METAL CHIP	3.9K	0.50%	1/16W
R272	1-216-817-11	METAL CHIP	470	5%	1/16W
R273	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R274	1-218-704-11	METAL CHIP	3.3K	0.50%	1/16W
R276	1-216-820-11	METAL CHIP	820	5%	1/16W

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Ref. No.	Part No.	Description	Remark		
R278	1-216-820-11	METAL CHIP	820	5%	1/16W
R280	1-216-841-11	METAL CHIP	47K	5%	1/16W
R281	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R282	1-216-833-11	METAL CHIP	10K	5%	1/16W
R283	1-216-833-11	METAL CHIP	10K	5%	1/16W
R284	1-216-864-11	METAL CHIP	0		
R285	1-216-821-11	METAL CHIP	1K	5%	1/16W
R286	1-216-811-11	METAL CHIP	150	5%	1/16W
R287	1-216-813-11	METAL CHIP	220	5%	1/16W
R288	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R290	1-216-815-11	METAL CHIP	330	5%	1/16W
R291	1-216-815-11	METAL CHIP	330	5%	1/16W
R292	1-216-820-11	METAL CHIP	820	5%	1/16W
R293	1-216-864-11	METAL CHIP	0		
R294	1-216-839-11	METAL CHIP	33K	5%	1/16W
R296	1-216-821-11	METAL CHIP	1K	5%	1/16W
R297	1-216-841-11	METAL CHIP	47K	5%	1/16W
R298	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R300	1-216-864-11	METAL CHIP	0		
R301	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R302	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R303	1-216-834-11	METAL CHIP	12K	5%	1/16W
R304	1-216-838-11	METAL CHIP	27K	5%	1/16W
R305	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R308	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R309	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R310	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R311	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R312	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R314	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R315	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R316	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R318	1-216-809-11	METAL CHIP	100	5%	1/16W
R319	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R321	1-216-864-11	METAL CHIP	0		
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R323	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R324	1-216-809-11	METAL CHIP	100	5%	1/16W
R325	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W
R331	1-216-864-11	METAL CHIP	0		
R332	1-216-817-11	METAL CHIP	470	5%	1/16W
R333	1-216-833-11	METAL CHIP	10K	5%	1/16W
R334	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R335	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R339	1-216-837-11	METAL CHIP	22K	5%	1/16W
R341	1-216-837-11	METAL CHIP	22K	5%	1/16W
R342	1-216-833-11	METAL CHIP	10K	5%	1/16W
R343	1-216-837-11	METAL CHIP	22K	5%	1/16W

Ref. No.	Part No.	Description	Remark		
R346	1-216-815-11	METAL CHIP	330	5%	1/16W
R347	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R348	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R350	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R351	1-216-845-11	METAL CHIP	100K	5%	1/16W
R352	1-216-845-11	METAL CHIP	100K	5%	1/16W
R353	1-216-845-11	METAL CHIP	100K	5%	1/16W
R354	1-216-864-11	METAL CHIP	0		
R355	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R356	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R357	1-216-845-11	METAL CHIP	100K	5%	1/16W
R358	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R359	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R360	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R361	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R362	1-216-833-11	METAL CHIP	10K	5%	1/16W
R364	1-216-821-11	METAL CHIP	1K	5%	1/16W
R365	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R366	1-216-817-11	METAL CHIP	470	5%	1/16W
R367	1-216-833-11	METAL CHIP	10K	5%	1/16W
R368	1-216-821-11	METAL CHIP	1K	5%	1/16W
R369	1-216-839-11	METAL CHIP	33K	5%	1/16W
R370	1-216-821-11	METAL CHIP	1K	5%	1/16W
R371	1-216-821-11	METAL CHIP	1K	5%	1/16W
R372	1-216-821-11	METAL CHIP	1K	5%	1/16W
R373	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R374	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R375	1-216-839-11	METAL CHIP	33K	5%	1/16W
R376	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R389	1-216-190-00	METAL GLAZE	470	5%	1/8W
R390	1-216-839-11	METAL CHIP	33K	5%	1/16W
R391	1-216-837-11	METAL CHIP	22K	5%	1/16W
R392	1-216-837-11	METAL CHIP	22K	5%	1/16W
R393	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R394	1-216-833-11	METAL CHIP	10K	5%	1/16W
R395	1-216-833-11	METAL CHIP	10K	5%	1/16W
R396	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R397	1-216-841-11	METAL CHIP	47K	5%	1/16W
R398	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R400	1-216-864-11	METAL CHIP	0		
R401	1-216-864-11	METAL CHIP	0		
R404	1-216-845-11	METAL CHIP	100K	5%	1/16W
R405	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R407	1-216-841-11	METAL CHIP	47K	5%	1/16W
R408	1-216-833-11	METAL CHIP	10K	5%	1/16W
R409	1-216-839-11	METAL CHIP	33K	5%	1/16W
R412	1-216-833-11	METAL CHIP	10K	5%	1/16W
R413	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R415	1-216-837-11	METAL CHIP	22K	5%	1/16W

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Ref. No.	Part No.	Description	Remark
R416	1-216-859-11	METAL GLAZE	1.5M 5% 1/16W
R418	1-216-830-11	METAL CHIP	5.6K 5% 1/16W
R420	1-216-832-11	METAL CHIP	8.2K 5% 1/16W
R421	1-216-864-11	METAL CHIP	0
R423	1-216-832-11	METAL CHIP	8.2K 5% 1/16W
R425	1-216-864-11	METAL CHIP	0
R426	1-216-817-11	METAL CHIP	470 5% 1/16W
R427	1-216-807-11	METAL CHIP	68 5% 1/16W
R428	1-216-817-11	METAL CHIP	470 5% 1/16W
R429	1-216-839-11	METAL CHIP	33K 5% 1/16W
R430	1-216-833-11	METAL CHIP	10K 5% 1/16W
R434	1-216-836-11	METAL CHIP	18K 5% 1/16W
R435	1-216-841-11	METAL CHIP	47K 5% 1/16W
R440	1-216-833-11	METAL CHIP	10K 5% 1/16W
R441	1-216-841-11	METAL CHIP	47K 5% 1/16W
R443	1-216-833-11	METAL CHIP	10K 5% 1/16W
R444	1-216-830-11	METAL CHIP	5.6K 5% 1/16W
R446	1-216-837-11	METAL CHIP	22K 5% 1/16W
R447	1-216-859-11	METAL GLAZE	1.5M 5% 1/16W
R449	1-216-830-11	METAL CHIP	5.6K 5% 1/16W
R452	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
R453	1-216-832-11	METAL CHIP	8.2K 5% 1/16W
R454	1-216-832-11	METAL CHIP	8.2K 5% 1/16W
R456	1-216-817-11	METAL CHIP	470 5% 1/16W
R457	1-216-807-11	METAL CHIP	68 5% 1/16W
R458	1-216-817-11	METAL CHIP	470 5% 1/16W
R460	1-216-839-11	METAL CHIP	33K 5% 1/16W
R461	1-216-833-11	METAL CHIP	10K 5% 1/16W
R462	1-216-836-11	METAL CHIP	18K 5% 1/16W
R463	1-216-841-11	METAL CHIP	47K 5% 1/16W
R465	1-216-841-11	METAL CHIP	47K 5% 1/16W
R466	1-216-841-11	METAL CHIP	47K 5% 1/16W
R467	1-216-853-11	METAL CHIP	470K 5% 1/16W
R468	1-216-853-11	METAL CHIP	470K 5% 1/16W
R469	1-216-841-11	METAL CHIP	47K 5% 1/16W
R470	1-216-841-11	METAL CHIP	47K 5% 1/16W
R471	1-216-821-11	METAL CHIP	1K 5% 1/16W
R474	1-216-821-11	METAL CHIP	1K 5% 1/16W
R484	1-216-841-11	METAL CHIP	47K 5% 1/16W
R485	1-216-817-11	METAL CHIP	470 5% 1/16W
R486	1-216-841-11	METAL CHIP	47K 5% 1/16W
R489	1-216-841-11	METAL CHIP	47K 5% 1/16W
R490	1-216-817-11	METAL CHIP	470 5% 1/16W
R491	1-216-841-11	METAL CHIP	47K 5% 1/16W
R492	1-216-841-11	METAL CHIP	47K 5% 1/16W
R493	1-216-829-11	METAL CHIP	4.7K 5% 1/16W
R494	1-216-814-11	METAL CHIP	270 5% 1/16W
R495	1-216-825-11	METAL CHIP	2.2K 5% 1/16W
R496	1-216-825-11	METAL CHIP	2.2K 5% 1/16W

Ref. No.	Part No.	Description	Remark
R497	1-216-827-11	METAL CHIP	3.3K 5% 1/16W
R498	1-216-837-11	METAL CHIP	22K 5% 1/16W
R499	1-216-839-11	METAL CHIP	33K 5% 1/16W
R600	1-216-835-11	METAL CHIP	15K 5% 1/16W
R601	1-216-835-11	METAL CHIP	15K 5% 1/16W
R603	1-216-833-11	METAL CHIP	10K 5% 1/16W
R604	1-216-833-11	METAL CHIP	10K 5% 1/16W
R605	1-216-841-11	METAL CHIP	47K 5% 1/16W
R608	1-216-829-11	METAL CHIP	4.7K 5% 1/16W
R621	1-216-864-11	METAL CHIP	0
R622	1-216-864-11	METAL CHIP	0
R630	1-216-821-11	METAL CHIP	1K 5% 1/16W
R631	1-216-821-11	METAL CHIP	1K 5% 1/16W
R636	1-216-864-11	METAL CHIP	0
R637	1-216-841-11	METAL CHIP	47K 5% 1/16W
R638	1-216-839-11	METAL CHIP	33K 5% 1/16W
R639	1-216-839-11	METAL CHIP	33K 5% 1/16W
R640	1-216-841-11	METAL CHIP	47K 5% 1/16W
R641	1-216-817-11	METAL CHIP	470 5% 1/16W
R642	1-216-864-11	METAL CHIP	0

< VARIABLE RESISTOR >

RV101	1-238-086-11	RES. ADJ. CERMET 470
RV201	1-238-091-11	RES. ADJ. CERMET 22K
RV202	1-238-087-11	RES. ADJ. CERMET 1K
RV203	1-238-088-11	RES. ADJ. CERMET 2.2K
RV204	1-238-087-11	RES. ADJ. CERMET 1K
RV205	1-238-091-11	RES. ADJ. CERMET 22K
RV206	1-238-088-11	RES. ADJ. CERMET 2.2K
RV207	1-238-089-11	RES. ADJ. CERMET 4.7K
RV210	1-238-088-11	RES. ADJ. CERMET 2.2K
RV211	1-238-092-11	RES. ADJ. CERMET 47K
RV301	1-238-086-11	RES. ADJ. CERMET 470
RV351	1-238-090-11	RES. ADJ. CERMET 10K
RV353	1-238-087-11	RES. ADJ. CERMET 1K
RV400	1-238-090-11	RES. ADJ. CERMET 10K
RV401	1-238-090-11	RES. ADJ. CERMET 10K
RV402	1-238-093-11	RES. ADJ. CERMET 100K
RV403	1-238-093-11	RES. ADJ. CERMET 100K
RV404	1-238-090-11	RES. ADJ. CERMET 10K
RV405	1-238-090-11	RES. ADJ. CERMET 10K
RV406	1-238-089-11	RES. ADJ. CERMET 4.7K
RV407	1-238-089-11	RES. ADJ. CERMET 4.7K

< SWITCH >

S201	1-572-275-11	SWITCH, SLIDE (IN/OUT) (AUS/E)
S400	1-570-850-11	SWITCH, SLIDE

VA-70P
VA-70PB
VC-96P

Ref. No.	Part No.	Description	Remark
< THERMISTOR >			
TH001	1-809-357-21	THERMISTOR	
TH700	1-800-200-00	THERMISTOR S-3K	
< FLEXIBLE BOARD >			
W702	1-633-976-11	FP-251 FLEXIBLE BOARD	
W704	1-633-979-11	FP-299 FLEXIBLE BOARD	
< VIBRATOR >			
X301	1-577-117-21	VIBRATOR, CRYSTAL	

* A-7062-776-A VC-96P BOARD, COMPLETE			

(Ref. No 6,000 Series)			
A-7068-186-A MX-10AP BOARD, COMPLETE (HIC)			

3-744-718-01 HOLDER (10), C			
< CAPACITOR >			
C302	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C401	1-164-634-11	CERAMIC CHIP 1uF	16V
C402	1-164-634-11	CERAMIC CHIP 1uF	16V
C403	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C404	1-164-634-11	CERAMIC CHIP 1uF	16V
C406	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C407	1-164-634-11	CERAMIC CHIP 1uF	16V
C408	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C409	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C410	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C411	1-124-566-11	ELECT 120uF	20% 6.3V
C412	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C413	1-164-634-11	CERAMIC CHIP 1uF	16V
C414	1-162-917-11	CERAMIC CHIP 15PF	5% 50V
C415	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C416	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C417	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C419	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C501	1-126-205-11	ELECT CHIP 47uF	20% 6.3V
C502	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C503	1-164-634-11	CERAMIC CHIP 1uF	16V
C504	1-128-292-11	ELECT 220uF	20% 10V
C506	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C507	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C508	1-135-072-21	TANTALUM CHIP 0.22uF	10% 35V
C509	1-162-970-11	CERAMIC CHIP 0.01uF	10% 25V

Ref. No.	Part No.	Description	Remark
C510	1-128-004-11	ELECT CHIP 10uF	20% 16V
C511	1-135-180-21	TANTALUM CHIP 3.3uF	20% 6.3V
C512	1-135-180-21	TANTALUM CHIP 3.3uF	20% 6.3V
C513	1-135-180-21	TANTALUM CHIP 3.3uF	20% 6.3V
C514	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C521	1-162-638-11	CERAMIC CHIP 1uF	16V
C651	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C653	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C654	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C656	1-135-091-00	TANTALUM CHIP 1uF	20% 16V
C657	1-135-091-00	TANTALUM CHIP 1uF	20% 16V
C659	1-135-180-21	TANTALUM CHIP 3.3uF	20% 6.3V
C660	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C661	1-164-005-11	CERAMIC CHIP 0.47uF	25V
C662	1-162-964-11	CERAMIC CHIP 0.001uF	10% 50V
C663	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C665	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C666	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C667	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C668	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C669	1-164-156-11	CERAMIC CHIP 0.1uF	25V
C750	1-162-974-11	CERAMIC CHIP 0.01uF	50V
C751	1-135-151-21	TANTALUM CHIP 4.7uF	20% 4V
< CONNECTOR >			
CN301	1-568-338-11	CONNECTOR, BOARD TO BOARD 24P	
CN302	1-568-331-11	CONNECTOR, BOARD TO BOARD 10P	
CN304	1-565-877-11	PIN, CONNECTOR (PC BOARD) 5P	
CN305	1-566-528-21	CONNECTOR, FPC (ZIF) 12P	
CN306	1-565-528-21	PIN, CONNECTOR (PC BOARD) 3P	
CN307	* 1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P	
CN308	* 1-565-541-11	PIN, CONNECTOR (PC BOARD) 2P	
CN651	* 1-566-187-11	PIN, CONNECTOR (PC BOARD) 8P	
CN652	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P	
CN653	1-565-877-11	PIN, CONNECTOR (PC BOARD) 5P	
CN654	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P	
CN655	* 1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P	
< DIODE >			
D501	8-719-404-46	DIODE MA110	
D502	8-719-404-46	DIODE MA110	
D503	8-719-404-46	DIODE MA110	
D504	8-719-404-46	DIODE MA110	
D651	8-719-976-90	DIODE DTZ4.3A	
< FILTER >			
FL301	1-236-759-21	FILTER, LOW PASS (TRAP)	
FL302	1-415-731-21	DELAY LINE, LC (YH)	
FL303	1-415-819-11	DELAY LINE, LC	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
FL401	1-415-730-21	DELAY LINE, LC (100NS)		R141	1-216-841-11	METAL CHIP 47K 5% 1/16W	
< IC >				R142	1-216-837-11	METAL CHIP 22K 5% 1/16W	
IC301	8-759-635-27	IC M62352GP		R143	1-216-845-11	METAL CHIP 100K 5% 1/16W	
IC401	8-752-038-XX	IC CXA1392R		R148	1-216-849-11	METAL CHIP 220K 5% 1/16W	
IC501	8-759-038-85	IC MC68HC11E9FU-SC400226		R149	1-216-864-11	METAL CHIP 0	
IC504	8-759-635-27	IC M62352GP		R154	1-216-864-11	METAL CHIP 0	
IC508	8-759-937-56	IC S-8054ALB-LM					
IC509	8-759-509-05	IC XRU40668F		R155	1-216-864-11	METAL CHIP 0	
IC510	8-759-998-96	IC LM324DR		R156	1-216-809-11	METAL CHIP 100 5% 1/16W	
IC651	8-759-981-82	IC RC3414M		R157	1-216-843-11	METAL CHIP 68K 5% 1/16W	
IC652	8-759-998-96	IC LM324DR		R158	1-216-862-11	METAL GLAZE 2.7M 5% 1/16W	
IC653	8-759-500-11	IC MM1036XFF		R159	1-216-809-11	METAL CHIP 100 5% 1/16W	
IC656	8-759-998-96	IC LM324DR					
< COIL >				R160	1-216-833-11	METAL CHIP 10K 5% 1/16W	
L401	1-410-391-11	INDUCTOR CHIP 68uH		R161	1-216-809-11	METAL CHIP 100 5% 1/16W	
L502	1-412-058-11	INDUCTOR CHIP 10uH		R162	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
L503	1-412-062-11	INDUCTOR CHIP 47uH		R163	1-216-845-11	METAL CHIP 100K 5% 1/16W	
< TRANSISTOR >				R164	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
Q301	8-729-905-23	TRANSISTOR 2SA1576		R165	1-216-837-11	METAL CHIP 22K 5% 1/16W	
Q302	8-729-905-23	TRANSISTOR 2SA1576		R166	1-216-836-11	METAL CHIP 18K 5% 1/16W	
Q303	8-729-907-47	TRANSISTOR 1M21		R167	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
Q401	8-729-907-47	TRANSISTOR 1M21		R168	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q402	8-729-907-47	TRANSISTOR 1M21		R169	1-216-864-11	METAL CHIP 0	
Q403	8-729-905-23	TRANSISTOR 2SA1576					
Q404	8-729-905-35	TRANSISTOR 2SC4081		R171	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q504	8-729-925-39	TRANSISTOR 1MH8		R173	1-216-813-11	METAL CHIP 220 5% 1/16W	
Q505	8-729-925-39	TRANSISTOR 1MH8		R181	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q506	8-729-925-77	TRANSISTOR 1MH6		R182	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
Q507	8-729-420-50	TRANSISTOR UN5215		R183	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q508	8-729-402-78	TRANSISTOR XN6401					
Q509	8-729-925-39	TRANSISTOR 1MH8		R184	1-216-835-11	METAL CHIP 15K 5% 1/16W	
Q510	8-729-905-35	TRANSISTOR 2SC4081		R185	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q513	8-729-907-47	TRANSISTOR 1M21		R186	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q516	8-729-905-35	TRANSISTOR 2SC4081		R187	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q652	8-729-402-42	TRANSISTOR UN5213		R188	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q653	8-729-905-23	TRANSISTOR 2SA1576					
Q654	8-729-106-60	TRANSISTOR 2SB1115A		R189	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q655	8-729-905-35	TRANSISTOR 2SC4081		R190	1-216-821-11	METAL CHIP 1K 5% 1/16W	
Q656	8-729-821-88	TRANSISTOR 2SK1332-3		R191	1-216-821-11	METAL CHIP 1K 5% 1/16W	
< RESISTOR >				R192	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R136	1-216-833-11	METAL CHIP 10K 5% 1/16W		R193	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R138	1-216-836-11	METAL CHIP 18K 5% 1/16W					
R139	1-216-837-11	METAL CHIP 22K 5% 1/16W		R194	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R140	1-216-837-11	METAL CHIP 22K 5% 1/16W		R195	1-216-821-11	METAL CHIP 1K 5% 1/16W	
				R196	1-216-813-11	METAL CHIP 220 5% 1/16W	
				R197	1-216-821-11	METAL CHIP 1K 5% 1/16W	
				R198	1-216-821-11	METAL CHIP 1K 5% 1/16W	
				R199	1-216-821-11	METAL CHIP 1K 5% 1/16W	
				R200	1-216-844-11	METAL CHIP 82K 5% 1/16W	
				R201	1-216-671-11	METAL CHIP 6.8K 0.5% 1/10W	
				R202	1-216-643-11	METAL CHIP 470 0.5% 1/10W	
				R203	1-216-681-11	METAL CHIP 18K 0.5% 1/10W	
				R204	1-216-671-11	METAL CHIP 6.8K 0.5% 1/10W	
				R205	1-216-659-11	METAL CHIP 2.2K 0.5% 1/10W	
				R206	1-216-681-11	METAL CHIP 18K 0.5% 1/10W	

VC-96P

Ref. No.	Part No.	Description	Remark		
R302	1-216-820-11	METAL CHIP	820	5%	1/16W
R304	1-216-821-11	METAL CHIP	1K	5%	1/16W
R307	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R310	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R311	1-216-821-11	METAL CHIP	1K	5%	1/16W
R312	1-216-836-11	METAL CHIP	18K	5%	1/16W
R313	1-216-837-11	METAL CHIP	22K	5%	1/16W
R314	1-216-864-11	METAL CHIP	0		
R316	1-216-839-11	METAL CHIP	33K	5%	1/16W
R317	1-216-836-11	METAL CHIP	18K	5%	1/16W
R318	1-216-833-11	METAL CHIP	10K	5%	1/16W
R321	1-216-833-11	METAL CHIP	10K	5%	1/16W
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R325	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R327	1-216-864-11	METAL CHIP	0		
R328	1-216-864-11	METAL CHIP	0		
R350	1-216-841-11	METAL CHIP	47K	5%	1/16W
R351	1-216-841-11	METAL CHIP	47K	5%	1/16W
R402	1-216-833-11	METAL CHIP	10K	5%	1/16W
R406	1-216-864-11	METAL CHIP	0		
R407	1-216-821-11	METAL CHIP	1K	5%	1/16W
R410	1-216-864-11	METAL CHIP	0		
R414	1-216-864-11	METAL CHIP	0		
R415	1-216-820-11	METAL CHIP	820	5%	1/16W
R416	1-216-817-11	METAL CHIP	470	5%	1/16W
R417	1-216-833-11	METAL CHIP	10K	5%	1/16W
R418	1-216-833-11	METAL CHIP	10K	5%	1/16W
R419	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R420	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R421	1-216-821-11	METAL CHIP	1K	5%	1/16W
R422	1-216-837-11	METAL CHIP	22K	5%	1/16W
R427	1-216-841-11	METAL CHIP	47K	5%	1/16W
R428	1-216-835-11	METAL CHIP	15K	5%	1/16W
R429	1-216-839-11	METAL CHIP	33K	5%	1/16W
R432	1-216-839-11	METAL CHIP	33K	5%	1/16W
R435	1-216-833-11	METAL CHIP	10K	5%	1/16W
R437	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R440	1-216-864-11	METAL CHIP	0		
R501	1-216-836-11	METAL CHIP	18K	5%	1/16W
R502	1-216-836-11	METAL CHIP	18K	5%	1/16W
R503	1-216-833-11	METAL CHIP	10K	5%	1/16W
R504	1-216-833-11	METAL CHIP	10K	5%	1/16W
R505	1-216-841-11	METAL CHIP	47K	5%	1/16W
R508	1-216-833-11	METAL CHIP	10K	5%	1/16W
R509	1-216-833-11	METAL CHIP	10K	5%	1/16W
R510	1-216-833-11	METAL CHIP	10K	5%	1/16W
R513	1-216-845-11	METAL CHIP	100K	5%	1/16W
R514	1-216-833-11	METAL CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description	Remark		
R515	1-216-857-11	METAL CHIP	1M	5%	1/16W
R517	1-216-833-11	METAL CHIP	10K	5%	1/16W
R518	1-216-833-11	METAL CHIP	10K	5%	1/16W
R521	1-216-833-11	METAL CHIP	10K	5%	1/16W
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W
R523	1-216-840-11	METAL CHIP	39K	5%	1/16W
R524	1-216-833-11	METAL CHIP	10K	5%	1/16W
R525	1-216-833-11	METAL CHIP	10K	5%	1/16W
R526	1-216-847-11	METAL CHIP	150K	5%	1/16W
R527	1-216-845-11	METAL CHIP	100K	5%	1/16W
R528	1-216-833-11	METAL CHIP	10K	5%	1/16W
R529	1-216-845-11	METAL CHIP	100K	5%	1/16W
R530	1-216-845-11	METAL CHIP	100K	5%	1/16W
R531	1-216-833-11	METAL CHIP	10K	5%	1/16W
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W
R533	1-216-833-11	METAL CHIP	10K	5%	1/16W
R534	1-216-837-11	METAL CHIP	22K	5%	1/16W
R535	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R536	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W
R546	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R547	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R560	1-216-833-11	METAL CHIP	10K	5%	1/16W
R561	1-216-864-11	METAL CHIP	0		
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W
R653	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R654	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R655	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R656	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R657	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R658	1-216-845-11	METAL CHIP	100K	5%	1/16W
R666	1-216-819-11	METAL CHIP	680	5%	1/16W
R667	1-216-821-11	METAL CHIP	1K	5%	1/16W
R672	1-216-821-11	METAL CHIP	1K	5%	1/16W
R678	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R680	1-216-821-11	METAL CHIP	1K	5%	1/16W
R681	1-216-820-11	METAL CHIP	820	5%	1/16W
R682	1-216-833-11	METAL CHIP	10K	5%	1/16W
R683	1-216-857-11	METAL CHIP	1M	5%	1/16W
R684	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R685	1-216-848-11	METAL CHIP	180K	5%	1/16W
R686	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R687	1-216-833-11	METAL CHIP	10K	5%	1/16W
R688	1-216-841-11	METAL CHIP	47K	5%	1/16W
R689	1-216-843-11	METAL CHIP	68K	5%	1/16W
R690	1-216-839-11	METAL CHIP	33K	5%	1/16W
R691	1-216-864-11	METAL CHIP	0		
R693	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R694	1-216-848-11	METAL CHIP	180K	5%	1/16W

VC-96P**VF-26P**

Ref. No.	Part No.	Description	Remark		
R698	1-216-837-11	METAL CHIP	22K	5%	1/16W
R699	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R700	1-216-855-11	METAL CHIP	680K	5%	1/16W
R701	1-216-837-11	METAL CHIP	22K	5%	1/16W
R702	1-216-864-11	METAL CHIP	0		
R703	1-216-864-11	METAL CHIP	0		
R750	1-216-695-11	METAL CHIP	68K	0.5%	1/10W
R751	1-216-833-11	METAL CHIP	10K	5%	1/16W
R752	1-216-105-00	METAL CHIP	220K	5%	1/10W
R753	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R754	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R755	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R800	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R801	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R802	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R803	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R804	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R805	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R806	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R807	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R809	1-216-821-11	METAL CHIP	1K	5%	1/16W
R810	1-216-821-11	METAL CHIP	1K	5%	1/16W

< VIBRATOR >

X501 1-578-689-21 VIBRATOR

* A-7062-278-A VF-26P BOARD, COMPLETE (TYPE 1)

(Ref. No 7,000 Series)

< CAPACITOR >

C901	1-126-369-11	ELECT	220uF	20%	6.3V
C902	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C904	1-127-515-11	ELECT (SOLID)	47uF	20%	6.3V
C905	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C906	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C907	△ 1-162-625-11	CERAMIC CHIP	0.0047uF	5%	50V
C908	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C909	1-126-193-11	ELECT	1uF	20%	50V
C911	1-131-388-00	TANTALUM	68uF	10%	6.3V
C912	1-102-038-00	CERAMIC	0.001uF		
C913	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C915	1-126-193-11	ELECT	1uF	20%	50V
C916	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C917	1-135-166-21	TANTALUM CHIP	47uF	10%	10V
C918	1-162-638-11	CERAMIC CHIP	1uF		16V
C919	1-135-070-00	TANTALUM CHIP	0.1uF	10%	35V

Ref. No.	Part No.	Description	Remark
C920	1-164-232-11	CERAMIC CHIP 0.01uF	50V

< CONNECTOR >

CN901	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
CN902	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
CN904	1-575-570-21	CONNECTOR, FPC/FFC 6P

< COMPOSITION CIRCUIT BLOCK >

CP901	1-238-119-11	RES, ADJ
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< SOCKET >

CRT901	1-526-978-21	SOCKET ASSY, CRT
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< DIODE >

D670	8-719-404-46	DIODE MA110
D903	8-719-400-20	DIODE MA152WA
D955	8-719-404-19	DIODE LN1251C

< IC >

IC901	8-759-420-01	IC AN2512S
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< COIL >

L901	1-410-645-31	INDUCTOR 100uH
L902	1-410-385-11	INDUCTOR CHIP 22uH
L903	△ 1-459-858-11	COIL, FERRITE (HLC)

< TRANSISTOR >

Q903	8-729-106-68	TRANSISTOR 2SD1615A
Q904	8-729-216-31	TRANSISTOR 2SA1163G

< RESISTOR >

R902	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R903	△ 1-216-041-00	METAL CHIP	470	5%	1/10W
R907	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R908	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R909	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R911	1-216-079-00	METAL CHIP	18K	5%	1/10W
R914	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R915	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R916	1-216-125-00	METAL CHIP	1.5M	5%	1/10W
R917	1-216-121-00	METAL CHIP	1M	5%	1/10W
R919	1-216-097-00	METAL CHIP	100K	5%	1/10W
R920	1-216-113-00	METAL CHIP	470K	5%	1/10W
R921	1-216-013-00	METAL CHIP	33	5%	1/10W
R922	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R923	1-216-025-00	METAL CHIP	100	5%	1/10W
R924	1-216-306-11	METAL CHIP	3.9	5%	1/10W

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

VF-26P

VF-27P

Ref. No.	Part No.	Description	Remark
R925	1-216-336-11	METAL CHIP 47K 1% 1/10W	
R926	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R928	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R929	△ 1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R930	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R931	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R950	1-216-041-00	METAL CHIP 470 5% 1/10W	
R951	1-216-295-00	METAL CHIP 0 5% 1/10W	

< VARIABLE RESISTOR >

RV901 1-238-647-11 RES. ADJ. METAL GLAZE 4.7M

< TRANSFORMER >

T901 △ 1-439-428-11 TRANSFORMER ASSY. FLYBACK

< THERMISTOR >

TH901 1-807-938-11 THERMISTOR

* A-7062-278-A VF-27P BOARD, COMPLETE

(Ref. No 9,000 Series)

< CAPACITOR >

C901	1-124-442-00	ELECT 330uF 20% 6.3V	
C903	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
C904	1-126-160-11	ELECT 1uF 20% 50V	
C905	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C906	1-131-381-00	TANTALUM 47uF 10% 10V	
C907	1-162-638-11	CERAMIC CHIP 1uF 16V	
C908	1-136-165-00	FILM 0.1uF 5% 50V	
C909	1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C910	1-124-587-11	ELECT 220uF 20% 6.3V	
C911	1-163-141-00	CERAMIC CHIP 0.001uF 5% 50V	
C912	△ 1-162-625-11	CERAMIC CHIP 0.0047uF 5% 50V	
C913	△ 1-162-625-11	CERAMIC CHIP 0.0047uF 5% 50V	
C914	△ 1-163-209-00	CERAMIC CHIP 0.0015uF 5% 50V	
C915	1-126-090-11	ELECT 82uF 20% 10V	
C916	1-126-163-11	ELECT 4.7uF 20% 50V	
C918	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C919	1-102-038-00	CERAMIC 0.001uF	

< CONNECTOR >

CN902 * 1-566-195-11 PIN, CONNECTOR (PC BOARD) 2P
 CN903 * 1-566-195-11 PIN, CONNECTOR (PC BOARD) 2P
 CN904 1-575-570-21 CONNECTOR, FPC/FFC 6P

Ref. No.	Part No.	Description	Remark
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< DIODE >

D903 8-719-400-20 DIODE MA152WA
 D955 8-719-404-19 DIODE LN1251C

< IC >

IC901 8-759-420-01 IC AN2512S

< COIL >

L901 1-410-831-21 INDUCTOR 82uH
 L902 1-408-977-21 INDUCTOR 39uH
 L903 △ 1-459-858-11 COIL, FERRITE (HLC)

< TRANSISTOR >

Q903 8-729-216-31 TRANSISTOR 2SA1163G
 Q904 8-729-100-66 TRANSISTOR 2SC1623
 Q905 8-729-106-68 TRANSISTOR 2SD1615A

< RESISTOR >

R903	1-216-041-00	METAL CHIP 470 5% 1/10W	
R905	1-216-007-00	METAL CHIP 18 5% 1/10W	
R906	△ 1-216-121-00	METAL CHIP 1M 5% 1/10W	
R908	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R909	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R910	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R911	1-216-013-00	METAL CHIP 33 5% 1/10W	
R912	1-216-691-11	METAL CHIP 47K 0.5% 1/10W	
R913	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R914	1-216-025-00	METAL CHIP 100 5% 1/10W	
R915	1-216-306-11	METAL CHIP 3.9 5% 1/10W	
R917	1-216-045-00	METAL CHIP 680 5% 1/10W	
R918	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R919	1-216-748-11	METAL CHIP 39K 5% 1/10W	
R920	1-216-748-11	METAL CHIP 39K 5% 1/10W	
R921	1-216-295-00	METAL CHIP 0 5% 1/10W	
R922	1-216-101-00	METAL CHIP 150K 5% 1/10W	
R923	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R924	1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R925	1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R926	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R928	△ 1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R933	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R950	1-216-041-00	METAL CHIP 470 5% 1/10W	

< VARIABLE RESISTOR >

RV901 1-230-873-11 RES. ADJ. METAL 47K
 RV902 1-230-866-11 RES. ADJ. METAL 470
 RV903 1-230-869-11 RES. ADJ. METAL 4.7K
 RV904 1-228-762-00 RES. ADJ. METAL GLAZE 1M

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

VF-27P

VF-26P

Ref. No.	Part No.	Description	Remark
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< TRANSFORMER >

T901	△ 1-439-431-11	TRANSFORMER ASSY, FLYBACK	
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* A-7062-278-A VF-26P BOARD, COMPLETE (TYPE 2)

(Ref. No 8,000 Series)

< CAPACITOR >

C901	1-126-369-11	ELECT	220uF	20%	6.3V
C902	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C904	1-127-515-11	ELECT (SOLID)	47uF	20%	6.3V
C905	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C906	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C907	△ 1-162-625-11	CERAMIC CHIP	0.0047uF	5%	50V
C908	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C909	1-126-193-11	ELECT	1uF	20%	50V
C911	1-131-388-00	TANTALUM	68uF	10%	6.3V
C912	1-102-038-00	CERAMIC	0.001uF		
C913	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C915	1-126-193-11	ELECT	1uF	20%	50V
C916	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C917	1-135-162-21	TANTALUM CHIP	33uF	20%	6.3V
C918	1-162-638-11	CERAMIC CHIP	1uF		16V
C919	1-135-070-00	TANTALUM CHIP	0.1uF	10%	35V
C920	1-164-232-11	CERAMIC CHIP	0.01uF		50V

< CONNECTOR >

CN901	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
CN902	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
CN904	1-575-570-21	CONNECTOR, FPC/FFC 6P

< COMPOSITION CIRCUIT BLOCK >

CP901	1-238-119-11	RES, ADJ
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< SOCKET >

CRT901	1-526-978-21	SOCKET ASSY, CRT
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< DIODE >

D670	8-719-404-46	DIODE	MA110
D903	8-719-400-20	DIODE	MA152WA
D955	8-719-404-19	DIODE	LN1251C

< IC >

IC901	8-759-511-01	IC	BA7147F
IC901	8-759-514-91	IC	XRA7147F

Ref. No.	Part No.	Description	Remark
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< COIL >

L901	1-410-645-31	INDUCTOR	100uH
L902	1-410-385-11	INDUCTOR CHIP	22uH
L903	△ 1-459-858-11	COIL, FERRITE (HLC)	

< TRANSISTOR >

Q903	8-729-106-68	TRANSISTOR	2SD1615A
Q903	8-729-420-81	TRANSISTOR	2SD874A
Q903	8-729-420-84	TRANSISTOR	2SD874A
Q904	8-729-216-31	TRANSISTOR	2SA1163G
Q904	8-729-216-32	TRANSISTOR	2SA1163L

< RESISTOR >

R903	△ 1-216-041-00	METAL CHIP	470	5%	1/10W
R907	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R908	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R909	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R911	1-216-079-00	METAL CHIP	18K	5%	1/10W
R914	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R915	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R916	1-216-125-00	METAL CHIP	1.5M	5%	1/10W
R917	1-216-121-00	METAL CHIP	1M	5%	1/10W
R919	1-216-097-00	METAL CHIP	100K	5%	1/10W
R920	1-216-111-00	METAL CHIP	390K	5%	1/10W
R921	1-216-011-00	METAL CHIP	27	5%	1/10W
R922	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R923	1-216-025-00	METAL CHIP	100	5%	1/10W
R924	1-216-306-11	METAL CHIP	3.9	5%	1/10W
R925	1-216-334-11	METAL GLAZE	22K	1%	1/10W
R926	1-218-165-11	METAL GLAZE	220K	1%	1/10W
R928	1-216-870-11	METAL CHIP	180K	1%	1/10W
R929	△ 1-216-073-00	METAL CHIP	10K	5%	1/10W
R930	1-216-089-00	METAL CHIP	47K	5%	1/10W
R950	1-216-041-00	METAL CHIP	470	5%	1/10W
R951	1-216-295-00	METAL CHIP	0	5%	1/10W

< VARIABLE RESISTOR >

RV901	1-238-647-11	RES, ADJ, METAL GLAZE 4.7M
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The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

VK-16P

VK-16PB

Ref. No.	Part No.	Description	Remark
* A-7071-424-A VK-16P BOARD, COMPLETE (AEP/UK)			

* A-7071-454-A VK-16PB BOARD, COMPLETE (AUS/E)			

(Ref. No 4, 000 Series)			
< CAPACITOR >			
C501	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
< CONNECTOR >			
CN501	1-566-530-11	CONNECTOR, FPC (ZIF) 14P	
< DIODE >			
D508	8-719-404-46	DIODE MA110	
D509	8-719-404-46	DIODE MA110	
D513	8-719-404-46	DIODE MA110	
D523	8-719-161-02	DIODE RD8.210SB	
D524	8-719-161-02	DIODE RD8.210SB	
D526	8-719-161-02	DIODE RD8.210SB	
D527	8-719-161-02	DIODE RD8.210SB	
D529	8-719-404-46	DIODE MA110	
< IC >			
IC960	8-749-921-76	IC GPIU56 (ON FP-413 FLEXIBLE)	
< RESISTOR >			
R501	1-216-029-00	METAL CHIP 150 5% 1/10W	
< SWITCH >			
S500	1-571-684-11	SWITCH, TACTIL (REW ◀◀)	
S503	1-571-684-11	SWITCH, TACTIL (FF ▶▶)	
S504	1-571-684-11	SWITCH, TACTIL (STOP □)	
S505	1-571-684-11	SWITCH, TACTIL (PAUSE ■■)	
S506	1-571-684-11	SWITCH, TACTIL (TIME/NEXT)	
S507	1-571-684-11	SWITCH, TACTIL (DATA (+))	
S508	1-571-684-11	SWITCH, TACTIL (DATA SCREEN)	
S509	1-571-684-11	SWITCH, TACTIL (AGE)	
S510	1-572-284-11	SWITCH, SLIDE (REC ●→) (AUS/E)	
S511	1-570-870-11	SWITCH, SLIDE (SP/LP)	
S512	1-571-684-11	SWITCH, TACTIL (FRAME >▶▶)	
S513	1-571-684-11	SWITCH, TACTIL (SLOW ▶▶)	
S514	1-572-283-11	SWITCH, SLIDE (CAM/OFF/PLAYER)	
S515	1-570-870-11	SWITCH, SLIDE (BEEP ON/OFF)	
S520	1-571-684-11	SWITCH, TACTIL (PB ▷)	
< FLEXIBLE BOARD >			
W550	1-639-045-11	FP-413 FLEXIBLE BOARD	
W551	1-633-981-11	FP-292 FLEXIBLE BOARD	

Ref. No.	Part No.	Description	Remark
MISCELLANEOUS			

54	* 8-814-268-00	MICROPHONE C-2033 SET (STEREO)	
163	1-808-505-12	SENSOR (DEW SENSOR)	
318	8-741-509-11	IC SBX1509-11 (RP-77 HIC BOARD)	
322	1-569-347-11	CONNECTOR, FPC (TRANSLATION) 13P	
351	1-547-481-11	LENS, ZOOM (VCL-8510XA)	
356	△ 1-466-230-21	CONVERTER UNIT, D/D	
364	1-547-381-12	FILTER BLOCK, OPTICAL (ON CCD IMAGER)	
365	8-752-604-72	IC ICX039AN-2 (CCD IMAGER)	
(ON CD-60P BOARD)			
BZ901	1-529-096-11	BUZZER, PIEZOELECTRIC	
CRT901	△ 1-526-978-21	SOCKET ASSY, CRT (ON VF-26P BOARD)	
(B TYPE (M))			
L901	△ 1-451-310-21	DEFLECTION YOKE (B/W) (ON VF-26P BOARD)	
(B TYPE (M))			
M901	A-7048-404-A	DRUM ASSY (DGU-63A-R)	
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)	
M903	A-7040-208-A	MOTOR ASSY, THREADING (LOADING)	
ND901	1-809-023-11	DISPLAY PANEL, LIQUID CRYSTAL (LCD ASSY)	
S901	1-572-692-11	SWITCH, PUSH (ZOOM SWITCH UNIT)	
V901	△ 1-452-482-11	CRT ASSY (M91JY260WB) (ON VF-27P BOARD)	
(A TYPE (C))			
V901	△ 1-546-085-11	CATHODE-RAY TUBE, B/W (ON VF-26P BOARD)	
(B TYPE (M))			
W901	△ 1-540-019-21	SOCKET ASSY, CRT (ON VF-27P BOARD)	
(A TYPE (C))			

ACCESSORY & PACKING MATERIAL			

A-6767-706-A RFU ADAPTOR (RFU-89EA) (E)			
A-6767-707-A RFU ADAPTOR (RFU-89EA) (UK)			
A-6768-254-A RFU ADAPTOR (RFU-90E) (AEP)			
A-6768-255-A RFU ADAPTOR (RFU-90AS) (Australian)			
1-465-395-41 COMMANDER, REMOTE (RMT-502) (E/Australian)			
1-465-395-81 COMMANDER, REMOTE (RMT-502) (AEP/UK)			
1-571-164-11 SWITCH, ANTENNA CHANGE (CABLE) (UK/E)			
1-573-291-11 ADAPTOR, CONVERSION (AEP/UK)			
1-575-334-11 CORD, CONNECTION			
* 3-340-514-01 BAG, PROTECTION			
3-701-625-00 BAG, POLYETHYLENE			
3-712-673-01 SCREWDRIVER (UK/E)			
* 3-741-532-01 CUSHION, ACC			
3-753-141-11 MANUAL, INSTRUCTION (ENGLISH) (AEP/UK)			
3-753-141-41 MANUAL, INSTRUCTION			
(FRENCH/GERMAN/SPANISH) (AEP)			
3-753-141-51 MANUAL, INSTRUCTION			
(DUTCH/SWEDISH/ITALIAN) (AEP)			

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
	3-753-141-61	MANUAL, INSTRUCTION (PORTUGUESE) (AEP)	
	3-753-141-71	MANUAL, INSTRUCTION (FINNISH/DANISH) (AEP)	
	3-753-484-11	MANUAL, INSTRUCTION (ENGLISH) (E/Australian)	
	3-753-484-41	MANUAL, INSTRUCTION (FRENCH/GERMAN/SPANISH) (E)	
	3-753-484-51	MANUAL, INSTRUCTION (ARABIC) (E)	
	3-753-484-61	MANUAL, INSTRUCTION (CHINESE) (E)	
*	3-764-631-12	INSTRUCTION, DEW CONDENSATION (AEP/E)	
	3-941-737-01	BELT, SHOULDER	
*	3-942-284-41	INDIVIDUAL CARTON	
*	3-942-304-01	CUSHION (UPPER)	
*	3-942-305-01	CUSHION (LOWER)	
**	AC-V65A	AC POWER ADAPTOR	
***	NP-66	BATTERY PACK	

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
 *** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

HARDWARE LIST

# 1	7-671-155-01	STEEL BALL 3.0
# 2	7-627-553-37	SCREW, PRECISION +P 2X3 TYPE3
# 3	7-627-553-68	SCREW, PRECISION +P 2X6 TYPE3
# 4	7-627-555-88	SCREW (M1.4X1.8)
# 5	7-621-281-15	SCREW +P 2X2
# 6	7-627-553-37	SCREW (M2X3), SPECIAL HEAD

SECTION 7 SERVICE MODE

☆ This unit adopts the camera adjustment and the EVR (Electronic Variable resistor) with the SENSER LANC system.

7-1. SENSER LANC

SENSER LANC is the LANC format to adjust the EVR (Electronic Variable resistor) of Video 8 Handycam and to perform tests by using the LANC (control L). This word stands for the same as the SERVICE LANC formerly used, however, the unified word "SENSER LANC" will be used with this substantial functions.

7-1-1. How to Use RM-95 jig (Adjustment remote controller)

RM-95 jig is used to operate the SENSER LANC. HOLD switch of this jig is remodelled for service to get the SENSER LANC mode. Replacing microcomputer in RM-95 is required for the old-model RM-95 jig, which has no page display function.

Old model	μ PD7503G-A71-12 μ PD7503G-C23-12	8-759-142-56 8-759-146-77	Page is not displayed (Replacing microcomputer is required)
New model	μ PD7503G-C56-12	8-759-148-35	Page is displayed

LCD display of RM-95

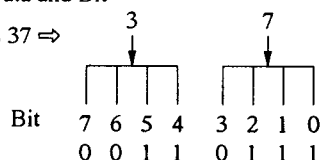
0:00:00
Page Data Address

Example 1:37:3d

This means that the page 1 and address 3D is data of 37.

• Reference between Data and Bit

When the data is 37 ⇒

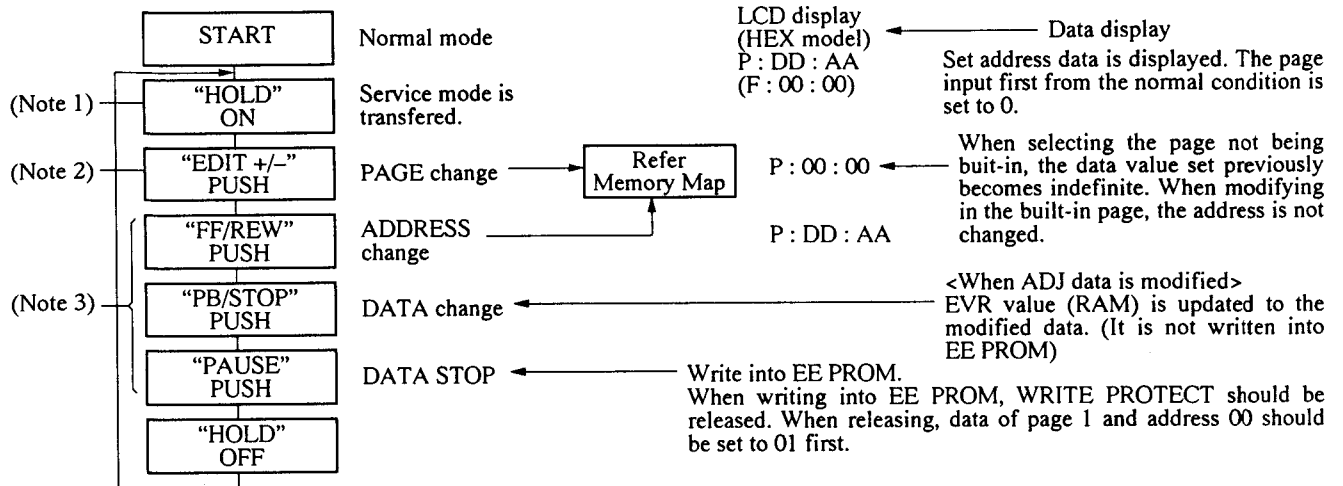


Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF	V MUTE	A MUTE	JOG	VA PB MODE
		0	0	1	1	0	1	1	1

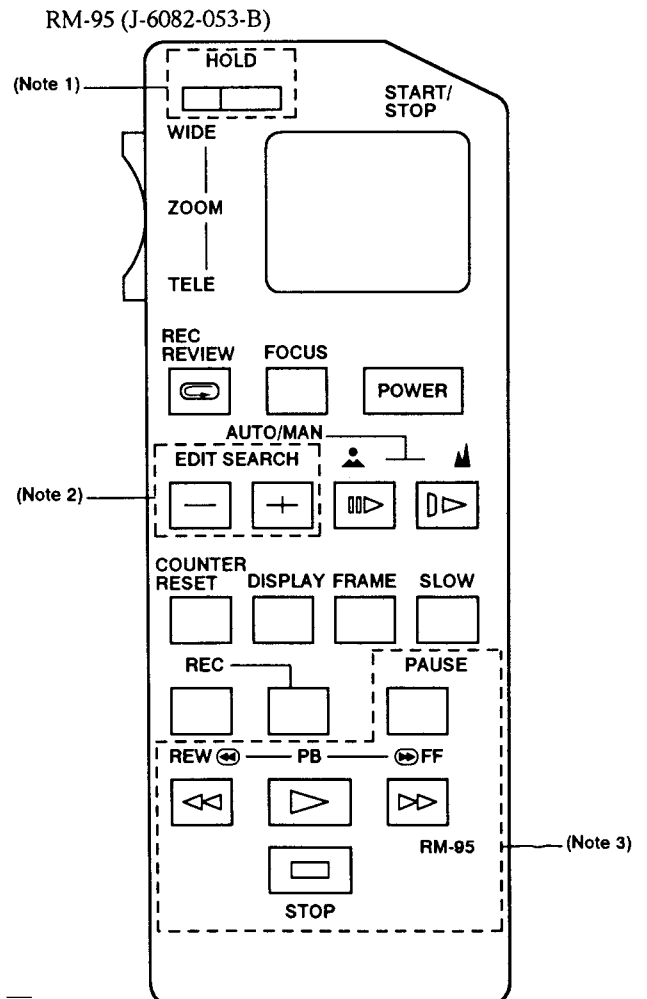
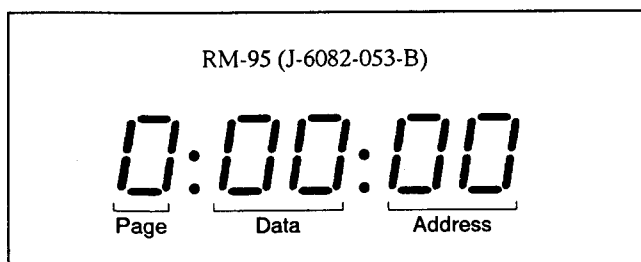
The data in the above list means as follows:

ME/MP SW ON
REC PROOF SW ON
AUDIO MUTE ON
JOG ON
VA PB MODE ON

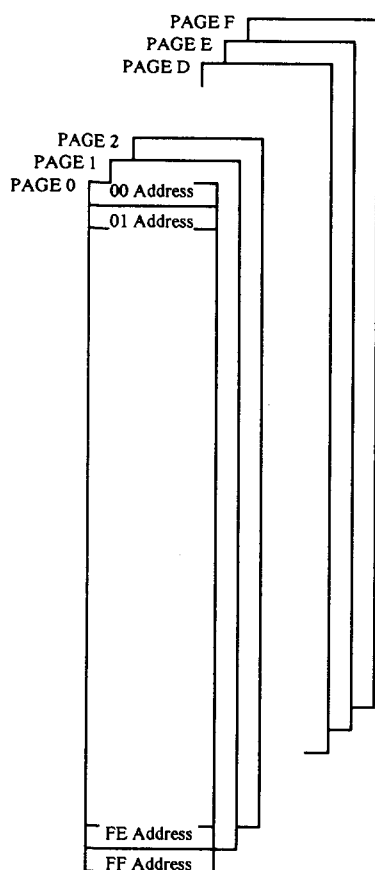
7-1-2. Transfer method of the service mode with RM-95



Command name	Command function	Function Button with RM-95
Page Up	Page +1	Edit Search +
Page Down	Page -1	Edit Search -
Direct Page Set	Set to direct page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address -1	Rewind
Data Up	Data +1	Play Back
Data Down	Data -1	Stop
Store	Write data into EEPROM. RAM	Pause



7-1-3. SENSER LANC Memory Map



PAGE	Page allocation	Description
0	Service	
1	Mode Control RAM	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2	Mode Control I/O	
3	Mechanical Control RAM	RAM and I/O memory area of the mechanical controller.
4	Mode Control I/O	
5	Camera microcomputer RAM	RAM and I/O memory area of the camera micro controller.
6	Camera microcomputer I/O	
7	Spare	
8	Spare	
9	Spare	
A	Spare	
B	Spare	
C	Spare	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is tuned off. Releasing protect is required for changing data.
E	Camera EE-PROM2	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is tuned off.
F	Camera EE-PROM1	

Note) There are 16 types of page from 0 to F. The allocation of page is as the above list. Only the memory of page D, E and F is not erased when the power is turned off as the EVR (Electronic Variable resistor).

7-1-4 Types of Self-diagnostic Feature

This unit has ADJUST mode and TEST mode as follows:

MODE		Contents
ADJUST	Camera adjustment	Refer to Camera Adjustment Refer to each adjustment page
	Switching position adjustment	
	Battery DOWN adjustment	
TEST	Pass adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergency is not detected except for TOP/END detection of the TAPE.
	Read of emergency code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

7-1-5. How to use practically

How to use:

How to set the adjustment mode and the TEST mode	
Set RM-95 to the service mode. (HOLD SW "ON")	
How to change and write data	
Press the PAUSE button of RM-95. Pressing PAUSE button is not required for some RAM and I/O area.	
Change and write data of EE-PROM	
Removing PROTECT is required. The PROTECT is removed by setting as follows:	
PAGE 1	Address 00 Data 01
But CAMERA system don't need release, because don't set PROTECT.	
How to release each mode	
Releasing from EE-PROM area	Be sure to return the data of PAGE 1 address 00 to 00 from 01, and then turn off the service mode of RM-95.
Releasing from RAM and I/O area	Turn off the service mode or turn off the power, because hoding of data is not required.

- In order to perform the pass track shift Refer to page 277.
- In order to inhibit the emergency detection Refer to the list in page 282.
- In order to check the emergency code Refer to page 283.
- In order to operate the motor singly Refer to page 287.
- In order to check the function switch Refer to page 285.
- In order to check the mechanical switch Refer to page 284.
- In order to read the A/D converted value Refer to page 287.
- In order to check the reception contents of the wireless remote control Refer to page 287.

SECTION 8

CAMERA ADJUSTMENTS

During the adjustment, see the arrangement diagram for adjustment parts from page 272.

8-1. PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

8-1-1. List of Servicing Jigs

- Oscilloscope • Regulated power supply (2 units) • Vectorscope • Digital voltmeter
- Adjusting screwdriver • Color monitor • Stop watch • L lench (1.25 mm)

Ref. No.	Part Name	Part No.	Use
J-1	Filter (C14) for color temperature correction	J-6080-058-A	Auto white balance adjustment/confirmation Outdoor white balance adjustment/confirmation
J-2	ND filter 1.0	J-6080-808-A	Max. gain adjustment (two filters used)
	ND filter 0.4	J-6080-806-A	Iris adjustment, shutter in/out adjustment
	ND filter 0.3	J-6080-818-A	Max. gain adjustment (two used)
	ND filter 0.1	J-6080-807-A	Iris adjustment, shutter in/out adjustment, Max. gain adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Pattern box color chart	J-6020-250-A	
J-5	Siemens star chart Transmission type simens-star chart	J-6080-875-A J-6080-923-A	Either of the siemens-star charts which appear during adjustment may be used.
J-6	AF microcomputer data reading jig*1	J-6082-025-A	
J-7	Adjustment remote controller*2	J-6082-053-B	
J-8	Extension cord (2P 1.5 mm pitch)	J-6082-873-A	To connect FU-104 board W991 and DC-DC converter
	Extension cord (5P 1.5 mm pitch)	J-6082-043-A	To connect VC-96 board CN304 and DC-DC converter
	Extension cord (4P 1.5 mm pitch)	J-6082-042-A	To connect VC-96 board CN307 and VA-70 board W701
J-9	Extension cord (20P)	J-6082-063-B	To connect VA-70 board CN703 and CT-40 board CN705
J-10	Extension cord (12P 1.0 mm pitch)	J-6082-056-A	To connect VC-96 board CN305 and VA-70 board W702
J-11	CPA connector jig	J-6082-109-A	Check point array on the VC-96 board.

*1 Change the value of R1 from 10kΩ to 100kΩ in the AF microcomputer data reading jig. (If the value is kept to 10k Ω , the adjustment data can not change because of the difference of the impedance.)

When adjustment the old-model Handy Cam, 100kΩ is allowed to perform the adustment.

*2 Microcomputer IC in the adjustment Remote controller except for μPD7503G-CS6-12 (8-759-148-35) does not allow the page selecting. Replace the microcomputer in such a case.

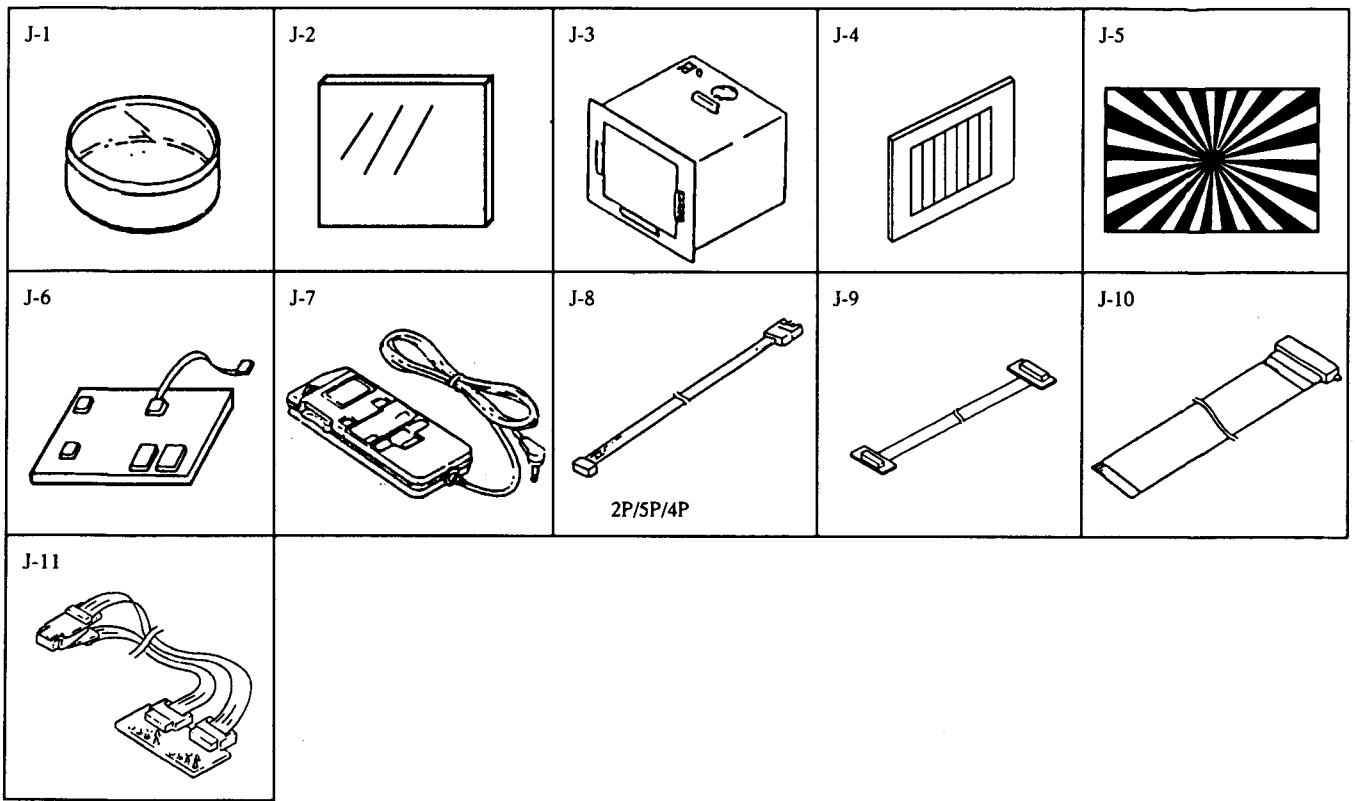


Fig. 8-1.

8-1-2. Preparations

Note: Refer to "2. DISASSEMBLY" for details on removal of the cabinet and various boards.

- 1) Connect the various devices for adjustment as shown in Fig. 8-3.
(Except for "Prime Oscillation Adjustment" and "PLL Adjustment", the adjustment can be done with camera and video blocks connected.)

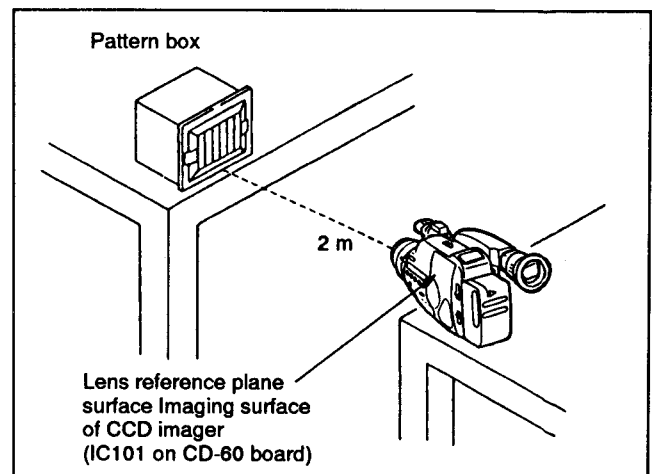


Fig. 8-2.

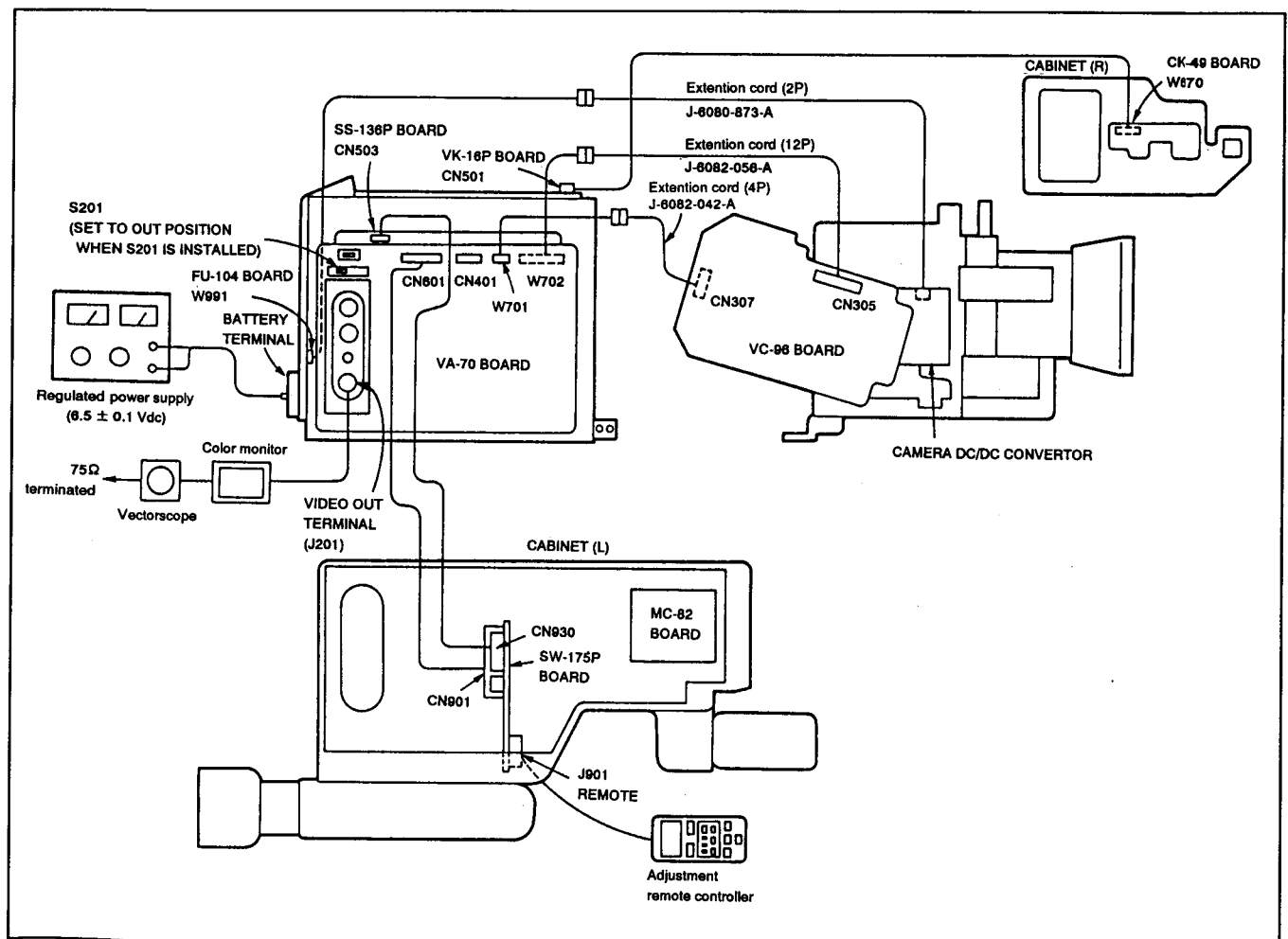


Fig. 8-3.

8-1-3. Precautions

1. Setting of switches

Unless otherwise specified, the switches are set to the following positions and adjustment is made without a cassette inserted.

1. Camera/video power switch (S514 on VK-16P board)
.....CAMERA
2. Standby switch (S900 on SW-175 board).....STANDBY
3. Auto-lock switch (S670 on CK-49 board).....OFF
4. White balance button (S676 on CK-49 board)
.....✱ (indoors white balance mode)
5. Shutter speed button (S671 on CK-49 board)
.....NORMAL (1/50)
6. Input/output select switch (S201 on VA-70 board)
.....OUT(✱ Except for AEP, UK model)
7. Back-light button (S675 on CK-49 board).....OFF
8. Program AE button (S672 on CK-49 board)
.....NORMAL (NO indications on LCD)

2. Adjustment order

As a rule, the adjustments are performed in the listed order.

3. Subjects

- 1) Color bar chart (standard picture frame)
When performing adjustment using the color bar chart, adjust the picture frame shown in Fig. 8-4. (standard picture frame).
- 2) White pattern (standard picture frame)
Remove the color bar chart from the pattern box and use the zoom lever so that the white pattern has the same size and is in the same position as the color bar chart (standard picture frame).
- 3) All white pattern
Remove the color bar chart from the pattern box and set the zoom lever fully to the TELE (85 mm) side.
- 4) Siemens star
Adjust the direction of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.

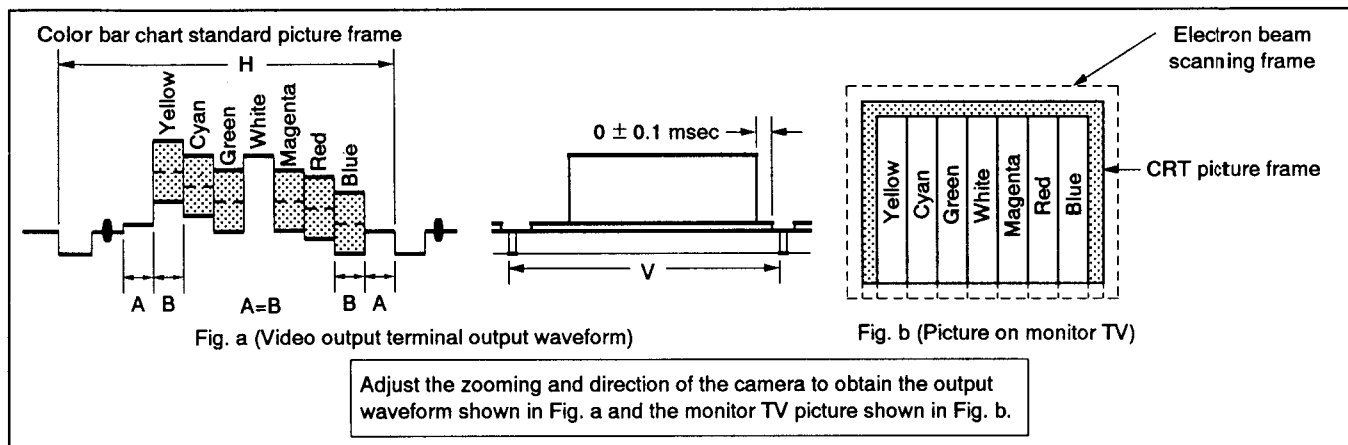


Fig. 8-4.

8-1-4. Adjustment Remote Controller

An EVR (electronic variable resistor) is used as the adjustment element for the camera block, replacing the conventional semi-fixed resistor. The EVR is controlled by the camera control microcomputer (IC501 on VC-96 board). This microcomputer reads the data written in the nonvolatile memory of the microcomputer and sends it to the EVR. The EVR D-A converts this data (8 bits for each adjustment point) and creates the adjustment voltage.

Thus, it is necessary to change the adjustment data contained in the nonvolatile memory when adjusting the camera block, and the adjustment memory is used for this purpose.

The adjustment remote controller performs bidirectional communications with the camera control microcomputer using the remote control signal lines (LANC). Adjustment page, adjustment addresses and adjustment data increment/decrement commands are sent to the camera control microcomputer from the adjustment remote controller. Adjustment page, adjustment addresses and adjustment data are sent from the camera control microcomputer to the adjustment remote controller.

Note: The microcomputer IC in the adjustment remote controller except for new microcomputer (UPD7503G-C56-12) dose not allow the adjustment page selecting. Rplace with the new microcomputer (8-759-148-35) in such a case.

1. Use of adjustment remote controller

- 1) Connect the adjustment remote controller to the remote terminal (J901 on SW-175P board).
- 2) Turn on the power of the main unit.
- 3) Set the HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position.).
- 4) If the connection is correct, the following is displayed on the adjustment remote control LCD.

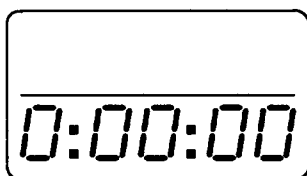


Fig. 8-5.

- 5) Specify your desired adjustment page by the adjustment remote controller. Presssing the EDIT SEARCH (+) increments the adjustment page. Pressing the EDIT SEARCH (-) decrements it. The adjustment page is shown in the hexadecimal numbers and there are 16 of them from 0 to F. The CAMERA adjustment page is page F and Pressing the EDIT SEARCH (-) button one push. (The adjustment data varies from one set to another.)

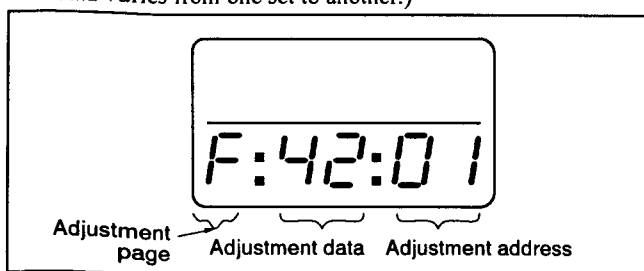


Fig. 8-6.

- 6) Specify your desired adjustment address by the adjustment remote controller. Pressing the FF (▶▶) button increments the adjustment address, and pressing the REW (◀◀) button decrements it.

(The adjustment address is shown in the decimal number and there are 256 of them from 00 to FF. The adjustment address corresponds to the output terminal of the EVR (IC301 on the VC-96 board, IC504 on the VC-96 board, and IC004 of the MX-10 board). Refer to Table 8-2 for adjustment of each address.)

- 7) Perform adjustment by incrementing or decrementing the adjustment data. The adjustment data is incremented by pressing the PLAY (▶) button. The adjustment data is decremented by pressing the STOP (■) button.

- The adjustment data is indicated in hexadecimal.

There are 256 values from 00 to FF.

Hexadecimal	0 1 2 3 4 5 6 7 8 9 A B C D E F
LCD Indication	0 1 2 3 4 5 6 7 8 9 a b c d e f
Decimal equivalent	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Table 8-1.

- The adjustment data corresponds to the output voltage of the EVR (IC301 on the VC-96 board, IC504 on the VC-96 board, and IC004 on the MX-10 board) as follows:
MX-10 board IC004:2.0 ↔ 5.0 Vdc
VC-96 board IC301:0 ↔ 5.0 Vdc
VC-96 board IC504:1.0 ↔ 3.5 Vdc
- 8) Change the adjustment address with the FF (▶▶) or REW (◀◀) button in order to store the adjustment data into the non-volatile memory built in the EVR/AWB microcomputer (VC-96 board IC501).
(If this operation is omitted, new adjustment data will not be stored into the non-volatile memory.)
 - 9) There is a function provided to make note of the last error caused by the COUNTER RESET button during operation of the set even if the power is turned off. This LAST MEMO EMERGENCY (last error) can be cleared.

8-1-5. Precuations on use of adjustment remote controller

It is possible to accidentally erase correct adjustment data due to an error in operation of the adjustment remote controller. In order to prevent this, we recommend that you make a note of all adjustment data before adjustment and record the new adjustment data after completing each adjustment item.

8-1-6. Adjustment address table (page F)

Note: Data already described in the adjustment data memo column are fixed data.

Adjustment Address	Adjustment Item	Remarks [Adjustment voltage output terminal]	Adjustment Data Memo Column
01	R CONT	[Pin ⑮ of IC004 on MX-10 board]	Auto white balance adjustment
02	B CONT	[Pin ⑰ of IC004 on MX-10 board]	
03	C1 GAIN	[Pin ② of IC004 on MX-10 board]	Matrix adjustment (3)
04	B GAIN	[Pin ③ of IC004 on MX-10 board]	Pre-white balance adjustment
05	R GAIN	[Pin ④ of IC004 on MX-10 board]	
06	Y2 GAIN	[Pin ⑤ of IC004 on MX-10 board]	Matrix adjustment (2)
07	Y1 GAIN	[Pin ⑥ of IC004 on MX-10 board]	Matrix adjustment (1)
08	YH GAIN	[Pin ⑦ of IC004 on MX-10 board]	YH Level adjustment
09	R-Y GAIN	[Pin ⑧ of IC004 on MX-10 board]	Color reproduction adjustment
0A	B-Y GAIN	[Pin ⑨ of IC004 on MX-10 board]	
0B	R-Y HUE	[Pin ⑫ of IC004 on MX-10 board]	
0C	B-Y HUE	[Pin ⑬ of IC004 on MX-10 board]	
0D	SHP LEVEL	[Pin ⑮ of IC301]	H aperture adjustment
0E	Y LEVEL	[Pin ⑰ of IC301]	Y level adjustment
0F	VAP GAIN	[Pin ② of IC301]	90
10	SET UP	[Pin ③ of IC301]	Setup adjustment
11	CHROMA LEVEL	[Pin ④ of IC301]	Chroma level adjustment
12	V SUB CONT	[Pin ⑤ of IC301]	V SUB adjustment
13	PG CONT	[Pin ⑥ of IC301]	PG CONT adjustment
14	Y γ CONT	[Pin ⑦ of IC301]	AE
15	WHITE CLIP	[Pin ⑧ of IC301]	White clip adjustment
16	SYNC LEVEL	[Pin ⑨ of IC301]	Sync level adjustment
17	BURST LEVEL	[Pin ⑫ of IC301]	Burst level adjustment
18	MAX GAIN	[Pin ⑬ of IC301]	Max gain adjustment
19	IRIS REF	[Pin ⑮ of IC504]	Iris adjustment
1A	AGC REF	[Pin ⑰ of IC504]	AGC adjustment
1B	HALL GAIN	[Pin ② of IC504]	Hall adjustment
1C	HALL OFFSET	[Pin ③ of IC504]	
1D	FADER LEVEL	[Pin ④ of IC504]	Not used
1E	AE OFFSET	[Pin ⑤ of IC504]	AE OFFSET adjustment
1F	FADER CONT	[Pin ⑥ of IC504]	00
20	FOCUS SPEED	[Pin ⑦ of IC504]	Not used
21	ZOOM SPEED	[Pin ⑧ of IC504]	
22	M IRIS CONT	[Pin ⑨ of IC504]	Not used
23	M AGC CONT	[Pin ⑫ of IC504]	Not used
24	AGC IN PULSE	[Pin ⑬ of IC504]	
25	IN-OUT		
26	M12 THR		
27	KATAMUKI		
28	FA-WM		
29	FA-BM		
2A	FH-WM		
2B	FH-BM		

Table 8-2. (1)

Adjustment Address	Adjustment Item	Remarks [Adjustment voltage output terminal]	Adjustment Data Memo Column
2C	FA-SMH		
2D	FA-SML		
2E	FH-SMH		
2F	FH-SML		
30	LOW-F-SPEED		
31	MAN-F-SPEED		
32	STEP-A		
33	END-SENS-V		
34	ZOOM POSI1		
35	ZOOM POSI2		
36	ZOOM POSI3		
37	ZOOM POSI4		
38	ZOOM POSI5		
39	FOCUS POSI1		
3A	SEARCH-V		
3B	BACKRUSH2		
3C	BACKRUSH-MODE3		
3D	ZOOM TAN MASK		
3E	ZOOM-END-V		
3F	ZOOM-MODOSI		
40-57			
58	ZOOM-SPEED1	High speed	7A
59	ZOOM-SPEED2	Middle speed (Remote control)	35
5A	ZOOM-SPEED3	Low speed	20
5B	ZOOM-SPEED4	Macro zoom speed	53
5C			00
5D			02
5E-5F			
60	IRISREF NOR	Standard AE level	Standard AE level and Program AE level adjustment
61	IRISREF PO	Portrait AE level	
62	IRISREF SP	Sports AE level	
63-6A			
6B	MAXSHUT PO (H)	Portrait max shutter speed	00
6C	MAXSHUT PO (L)		CE
6D	MAXSHUT SP (H)	Sports max shutter speed	00
6E	MAXSHUT SP (L)		E6
6F	REF WIDTH	Program AE level hysteresis	0C
70			00
71	SHUT MULTI		40
72			
73	SHUT CONT 1		06
74	SHUTSTEP MULTI		02
75	IRIS OPEN		20
76	REF TURBO		40
77			
78	TURBO WIDTH		0C

Table 8-2. (2)

Adjustment Address	Adjustment Item	Remarks [Adjustment voltage output terminal]	Adjustment Data Memo Column
79			
7A	TURBO TH		0C
7B			
7C	SHUT COUNT 2		01
7D	SHUT COUNT 3		01
7E-7F			
80	USER R-Y GAIN		10
81	USER B-Y GAIN		0D
82	USER B-Y HUE		0D
83	USER R-Y HUE		0C
84	USER SHP LEVEL		0A
85	USER Y LEVEL		0C
86			
88		Hall adjustment	
87			
89			
8A			
8B			
8C-8F			
90	R3200 MSB	3200K preset data (red) } 3200K preset data (blue) } Auto white balance preset adjustment 3200K preset data (green) }	
91	R3200 LSB		
92	B3200 MSB		
93	B3200 LSB		
94	G3200 MSB		
95	G3200 LSB		
96	SHUTTER IN	Shutter in/out adjustment	
97	SHUTTER OUT		
98	IRIS IN		B0
99	IRIS OUT		C0
9A-AB			
AC	BTM SLP R		48
AD	BTM SLP B		78
AE	MDL SLP R		60
AF	MDL SLP B		40
B0	TOP SLP R		66
B1	TOP SLR B		18
B2	KEIKO R		66
B3	KEIKO B		18
B4	BTM UP		C2
B5	BTM DOWN		A0
B6	MDL UP		A0
B7	MDL DWN		96
B8	TOP UP		78
B9	TOP DWN		60
BA	KEIKO		6C
BB	KEIKO DWN		60

Table 8-2. (3)

Adjustment Address	Adjustment Item	Remarks [Adjustment voltage output terminal]	Adjustment Data Memo Column																																														
BC	R TOP LMT		6E																																														
BD	R DWN LMT		21																																														
BE	B TOP LMT		8C																																														
BF	B IN TOP		65																																														
C0	B IN MAX		5C																																														
C1	B OUT MIN		5C																																														
C2	B OUT DWN		4A																																														
C3	B DWN LMT		1B																																														
C4	LL LMT		06																																														
C5	TM DIVID		5C																																														
C6	BM DIVID		39																																														
C7	DELAY TM		06																																														
C8	FAST TM		40																																														
C9	OUT HYS OFF		0E																																														
CA	OUT B HYS		07																																														
CB-CF																																																	
D0	SYSTEM CONFIGRATION		01																																														
D1																																																	
D2-D5																																																	
D6																																																	
D7																																																	
D8																																																	
D9																																																	
DA																																																	
DB																																																	
DC-DF																																																	
E0	DISPLAY MODE		00																																														
E1																																																	
E2-EA																																																	
EB	TEST MODE	The following test mode is selected by changing adjustment data. <table><tr><th>Adjustment Data</th><th>Test Mode</th><th>Remarks</th></tr><tr><td>00</td><td>NORMAL</td><td></td></tr><tr><td>01</td><td>F-HANTING</td><td rowspan="3">Not used</td></tr><tr><td>03</td><td>ZOOM-POSI</td></tr><tr><td>05</td><td>IRIS-POSI</td></tr><tr><td>0B</td><td>AGC-CONT</td><td>AGC CONT level</td></tr><tr><td>0D</td><td>FOCUS-POSI</td><td>Not used</td></tr><tr><td>11</td><td>SHUTTER</td><td>Shutter speed</td></tr><tr><td>13</td><td>IRIS LEVEL</td><td>IRIS CONT level</td></tr><tr><td>ED</td><td>FILTER-FHM</td><td rowspan="10">Not used</td></tr><tr><td>EF</td><td>FILTER-FAM</td></tr><tr><td>F1</td><td>FILTER-SFH L</td></tr><tr><td>F3</td><td>FILTER-SFH H</td></tr><tr><td>F5</td><td>FILTER-SFA L</td></tr><tr><td>F7</td><td>FILTER-SFH H</td></tr><tr><td>F9</td><td>FILTER-FA L</td></tr><tr><td>FB</td><td>FILTER-FH L</td></tr><tr><td>FD</td><td>FILTER-FA H</td></tr><tr><td>FF</td><td>FILTER-FH H</td></tr></table>	Adjustment Data	Test Mode	Remarks	00	NORMAL		01	F-HANTING	Not used	03	ZOOM-POSI	05	IRIS-POSI	0B	AGC-CONT	AGC CONT level	0D	FOCUS-POSI	Not used	11	SHUTTER	Shutter speed	13	IRIS LEVEL	IRIS CONT level	ED	FILTER-FHM	Not used	EF	FILTER-FAM	F1	FILTER-SFH L	F3	FILTER-SFH H	F5	FILTER-SFA L	F7	FILTER-SFH H	F9	FILTER-FA L	FB	FILTER-FH L	FD	FILTER-FA H	FF	FILTER-FH H	00
Adjustment Data	Test Mode	Remarks																																															
00	NORMAL																																																
01	F-HANTING	Not used																																															
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0B	AGC-CONT	AGC CONT level																																															
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13	IRIS LEVEL	IRIS CONT level																																															
ED	FILTER-FHM	Not used																																															
EF	FILTER-FAM																																																
F1	FILTER-SFH L																																																
F3	FILTER-SFH H																																																
F5	FILTER-SFA L																																																
F7	FILTER-SFH H																																																
F9	FILTER-FA L																																																
FB	FILTER-FH L																																																
FD	FILTER-FA H																																																
FF	FILTER-FH H																																																

Table 8-2. (4)

Adjustment Address	Adjustment Item	Remarks [Adjustment voltage output terminal]	Adjustment Data Memo Column												
EC	AWB MODE 3	The following auto white balance mode is selected by changing the adjustment data. <table><tr><td>Adjustment Data</td><td>AWB mode</td></tr><tr><td>01</td><td>NORMAL</td></tr><tr><td>02</td><td>AUTO WHITE BALANCE CHECK</td></tr></table>	Adjustment Data	AWB mode	01	NORMAL	02	AUTO WHITE BALANCE CHECK	01						
Adjustment Data	AWB mode														
01	NORMAL														
02	AUTO WHITE BALANCE CHECK														
ED	AWB MODE 2		00												
EE	AWB MODE 1	The following auto white balance adjustment mode is selected by changing the adjustment data. <table><tr><td>Adjustment Data</td><td>Adjustment Mode</td></tr><tr><td>00</td><td>AWB MODE 1</td></tr><tr><td>D0</td><td>WB DIRECT</td></tr><tr><td>F0</td><td>WB FREE</td></tr><tr><td>01</td><td>3200k Data fetch 1</td></tr><tr><td>23</td><td>3200k Data fetch 2</td></tr></table>	Adjustment Data	Adjustment Mode	00	AWB MODE 1	D0	WB DIRECT	F0	WB FREE	01	3200k Data fetch 1	23	3200k Data fetch 2	00
Adjustment Data	Adjustment Mode														
00	AWB MODE 1														
D0	WB DIRECT														
F0	WB FREE														
01	3200k Data fetch 1														
23	3200k Data fetch 2														
EF			00												
F0															
F1															
F2															
F3															
F4-FD		Not used													
FE															
FF															

Table 8-2. (6)

8-1-7. Check Point Array

Almost all of the measurement points for camera block adjustment are located in the check point array on the VC-96 board. Solder short lead wires onto the terminals needed for adjustment and connect an oscilloscope, etc.

The terminal numbers and signal names for the check point array are shown in Table 8-3.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	N.C	B1	N.C
A2	PG CONT	B2	N.C
A3	N.C	B3	Y LPF OUT
A4	N.C	B4	V SUB
A5	VAP OUT	B5	VAP SLICE
A6	TP	B6	N.C
A7	WB-G	B7	YH GAIN
A8	CAM Y	B8	Y2 GAIN
A9	YH	B9	N.C
A10	CAM C	B10	GND
A11	YH OUT 1	B11	IRIS OUT

* N.C.....no connection

Table 8-3.

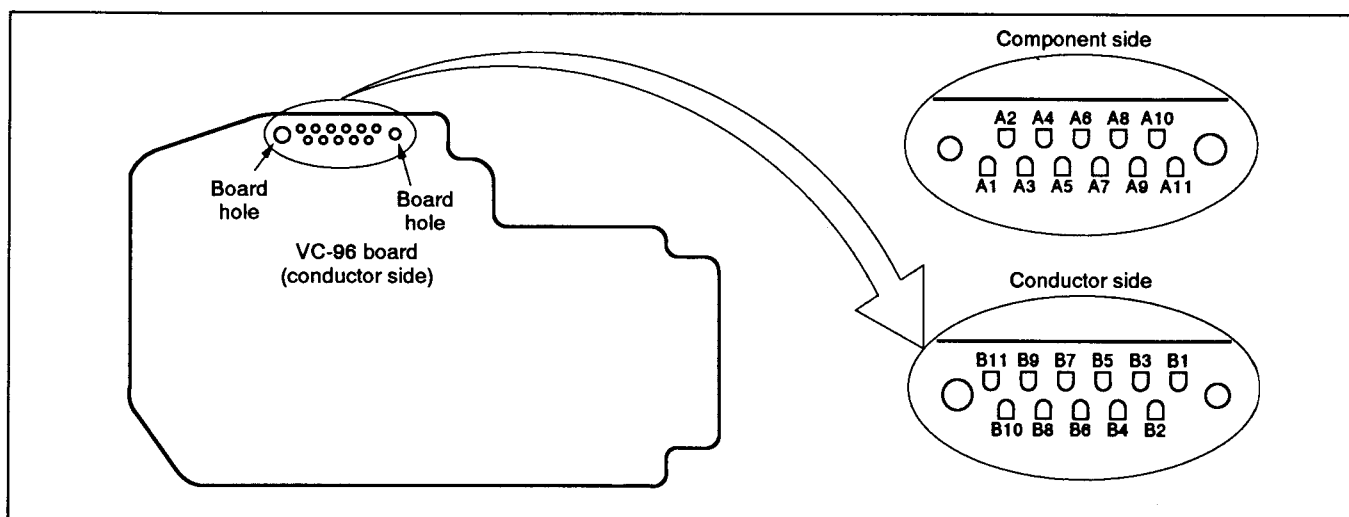


Fig. 8-7.

8-1-8. AF Microcomputer Data Reading Jig

The AF microcomputer data reading jig converts the serial data (output data varies according to hall (iris) state, shutter speed, AGC CONT level, IRIS CONT level, etc.) for adjustment output from the camera control microcomputer (IC501 on VC-96 board) into a 2-digit hexadecimal code and displays it on the LED.

Note:

Change the value of R1 from 10k Ω to 100k Ω in the AF microcomputer data reading jig. (If the value is kept to difference of the impedance.)

When adjusting the old-model Handy Cam, 100k Ω is allowed to perform the adjustment.

Connections:

Connect as shown in the diagram below.

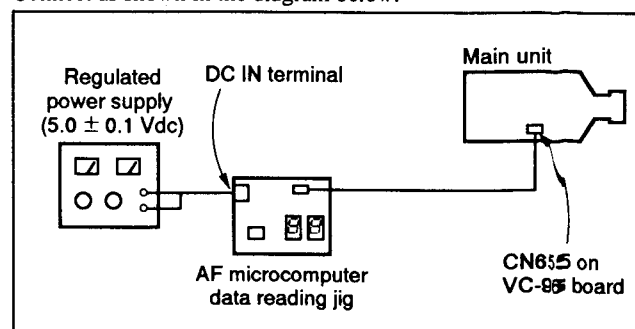


Fig. 8-8.

8-1-9. Data Processing

For some of the adjustment items, calculation from the data (hexadecimal) indicated on the AF microcomputer data reading jig and adjustment remote controller is needed to obtain the adjustment data. In these cases, convert the hexadecimal values to decimal before calculation and reconvert the result to hexadecimal to obtain the adjustment data. A hexadecimal — decimal conversion table is shown in Table 8-4.

Hexadecimal-Decimal Conversion Table

Hexadecimal lower digit Hexadecimal upper digit	0	1	2	3	4	5	6	7	8	9	A (H)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (H)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① → B (b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: () is the indication on the jig or adjustment remote commander.

Example: The indication on the jig or adjustment remote commander is BD (b d).

As the upper digit is B (b) and the lower digit is D (d), a decimal value of 189 is obtained from the intersection of ① and ② in the above table.

Table 8-4.

8-2. CAMERA SYSTEM ADJUSTMENTS

- Set the address 00 data (on page 5) to 01 and perform the adjustment.
(WINDOW OFF mode is set. This mode is automatically released by turning the power off.)
- In principle, all adjustments must be made in accordance with Adjustment procedure.
- When replacing lens, do not forget to make the following adjustment.

[Adjustment Sequence]

- 1) Flange Back Adjustment
 - 2) Auto Focus Adjustment
 - 3) HALL Adjustment
 - 4) IRIS Adjustment
 - 5) Shutter IN/OUT Adjustment
- When replacing CCD imager, do not forget to adjust the camera system property.

8-2-1. Flange Back Adjustment

Subject	Siemens star (2 m directly in front of the lens)
Measurement Point	Check with a monitor TV
Measuring Instrument	
Adjusting Element	Flange back adjusting pin
Tools	Phillips screwdriver, flat blade (-) screwdriver

Adjusting method:

- 1) Press the FOCUS button to set to the MANUAL mode.
- 2) Position a Siemens star 2 m directly in front of the lens (See Fig. 8-2.).
- 3) Orient the camera block to have the center of the Siemens star imaged on the monitor TV screen coincide with the monitor screen center.
- 4) Check to assure the smooth motion of the lens zoom lever to both its extreme WIDE position (8.5 mm) and TELE position (85 mm), and then set it at the extreme WIDE position. (In this process, also check the monitor image to assure proper zooming operation.)
- 5) Select the page F and the address 19 with the adjustment remote controller, and make note of the adjustment data for this address.
- 6) Set the adjustment data to FF with the adjustment remote controller. (Iris open mode)
At this time, adjust the illumination on the Siemens star or place an ND filter over the lens, and confirm that the proper image is displayed on the monitor TV screen.
- 7) Loosen flange back setscrew ③ with a Phillips screwdriver. (See Fig. 8-9.)
- 8) Overlap the stopper bottom end ① and focus mark line ②. (See Fig. 8-9.)
- 9) By turning the flange back adjusting Pin ④ while watching the monitor screen, attain the optimum definition of a wedge at the Siemens star center on the screen. (Turn it a few turns to the left and right to ensure optimum definition.)
Note: Do not turn the adjusting pin excessively in either direction.
- 10) While holding the flange back adjusting Pin ④ to prevent further rotation, retighten the flange back setscrew ③.
- 11) Check to see that the stopper bottom end is set within the range shown in Fig. 8-10 when the focus is matched by turning the focus ring.
If not, repeat steps 8) through 10).
- 12) After setting the zoom lever to TELE end, set it to WIDE end again.
- 13) With the zoom lever fixed at its WIDE end, turn the focusing ring and set it to the position that provides the optimum definition image of the wedge. Check to assure the lower side of stopper is within the range shown in Fig. 8-10.
- 14) Set the adjustment address to 19 and enter the adjustment data recorded in 5).
(Iris normal)
- 15) Change the adjustment address to store the adjustment data in the memory.

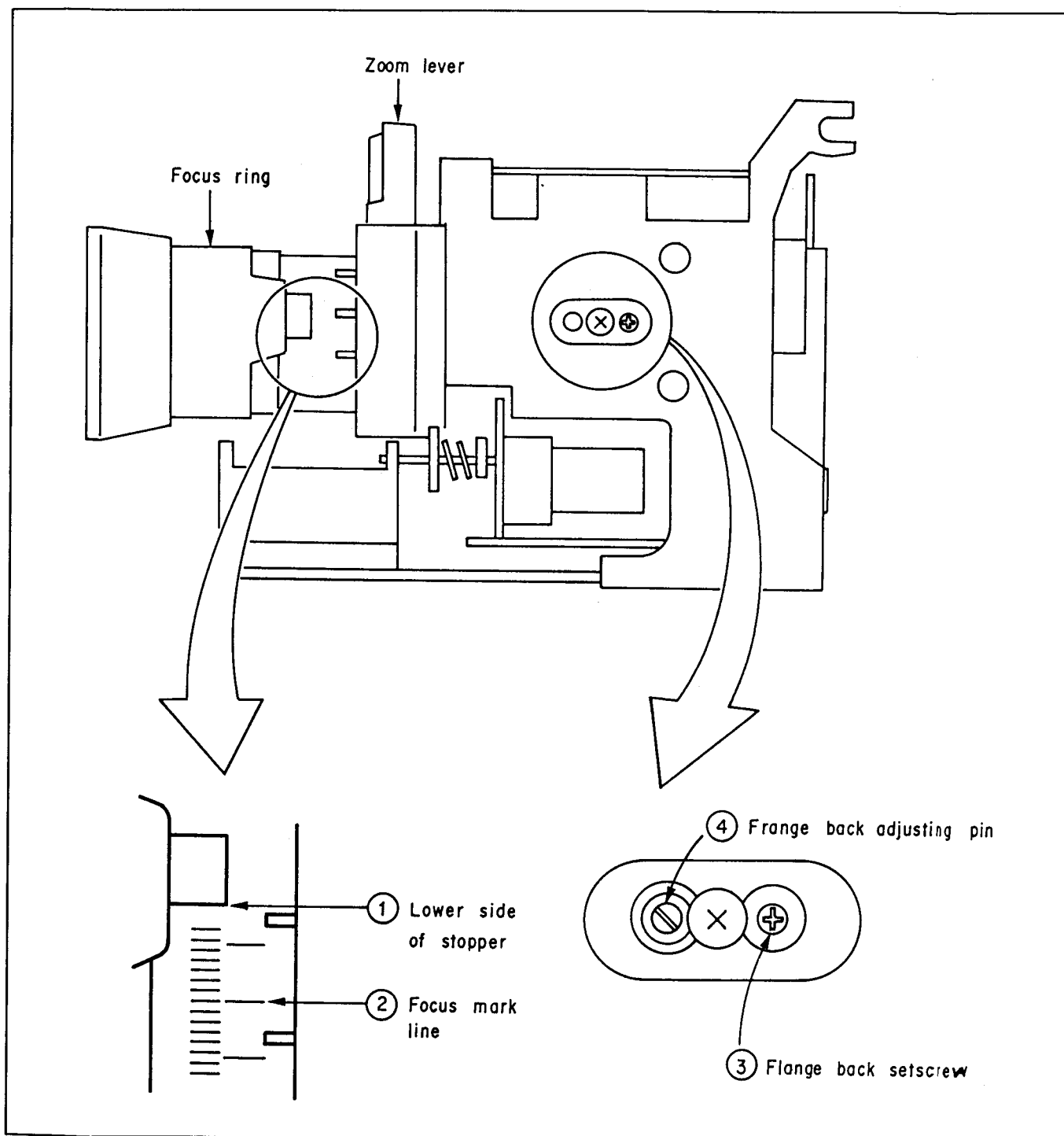


Fig. 8-9

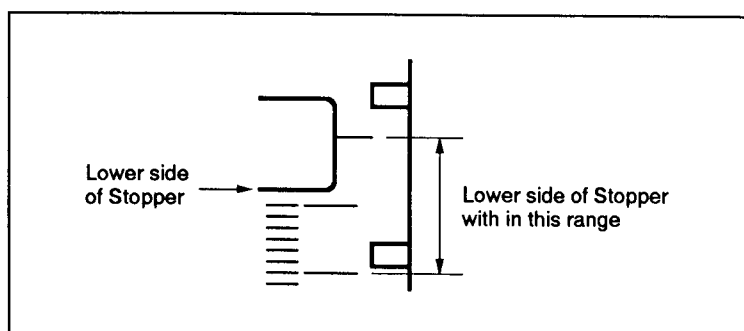


Fig. 8-10

8-2-2. Auto Focus Adjustment

Subject	IR AF adjusting chart (2m directly in front of lens reference plane)
Measurement Point	Check with a monitor TV.
Measuring Instrument	
Adjustment page	AF adjustment screw
Adjustment Address	Hexagonal wrench (1.25 mm)
Specified Value	0 ± 1 mm

IR AF Adjusting chart: Fig. 8-11 (a)

Write the following pattern on the white Kent paper (A3 size).

- 1) Reticle to indicate chart center.
- 2) Minute pattern to discriminate focus condition.

A pattern example is shown below.

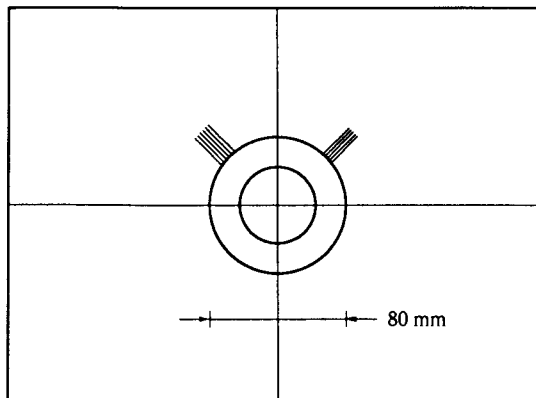


Fig. 8-11 (a).

Adjusting method:

- 1) Position a IR AF adjusting chart 2m directly in front of the lens reference plane (see Fig. 8-2).
- 2) Adjust the illumination on the chart so that the proper image is displayed on the monitor TV.
- 3) Turn on the auto focus.
- 4) Set the zoom lever to TELE end → WIDE end → TELE end and fix at TELE end.
- 5) Orient the camera block to have the center of chart imaged on the monitor TV screen coincide with the monitor screen center.
- 6) Turn the AF adjustment screw with hexagonal wrench (1.25 mm) and adjust the focus on the Siemens star.
- 7) Turn the focus ring to WIDE end (0.75m).
- 8) Check to see that the stop position of the focus ring is within ± 1 mm against the optimum focus position.
- 9) Turn the focus ring to TELE end (∞).
- 10) Check to see that the stop position is within ± 1 mm against the optimum focus position.
- 11) Position the IR AF adjusting chart 1m directly in front of the lens reference plane and check the stop position of the focus ring in the same procedure of 2m position. When the difference against the optimum focus position is ± 2.0 mm or more, check if the specification is met after positioning 2m in front of the reference lens plane again after readjusting the AF adjustment screw.

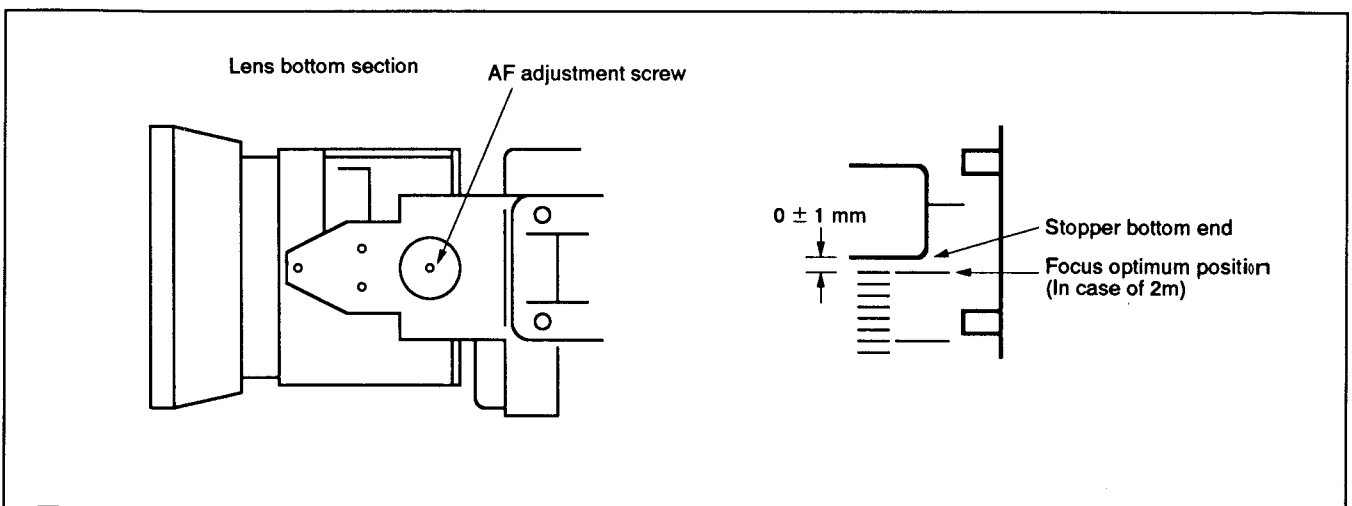


Fig. 8-11 (b).

**8-2-3. CAMERA DC-DC converter Check
(VC-96, CD-60 Board)**

Measuring Instrument	Digital voltmeter
CAM 4.9V Check	
Measurement Point	Pin ④ of CN304 on VC-96 board
Specified Value	4.9 ± 0.1 Vdc
4.9V Check	
Measurement Point	Pin ③ of CN101 on CD-60 board
Specified Value	4.9 ± 0.1 Vdc
15V Check	
Measurement Point	Pin ① of CN101 on CD-60 board
Specified Value	15.0 ± 0.2 Vdc
-9V Check	
Measurement Point	Pin ② of CN101 on CD-60 board
Specified Value	-9.00 ± 0.15 Vdc

Checking method:

- 1) Confirm that each voltage meet the specified value.

8-2-4. EVR Initial Settings

Set to the following initial settings of the adjustment data when the CAMERA microcomputer or the CCD IMAGER was replaced.

Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value
0E (Y LEVEL)	9C	76 (REF TURBO)	40	B9 (TOP DWN)	60
0F (VAP GAIN)	90	78 (TURBO WIDTH)	0C	BA (KEIKO)	6C
12 (V SUB CONT)	3A	7A (TURBO TH)	0C	BB (KEIKO DWN)	60
13 (PG CONT)	5A	7C (SHUT COUNT 2)	01	BC (R TOP LMT)	6E
14 (Y γ CONT)	AE	7D (SHUT COUNT 3)	01	BD (R DOWN LMT)	21
15 (WHITE CLIP)	FF	80 (USER R-Y GAIN)	10	BE (B TOP LMT)	8C
18 (MAX GAIN)	E0	81 (USER B-Y GAIN)	0D	BF (B IN TOP)	65
19 (IRIS REF)	4C	82 (USER B-Y HUE)	0D	C0 (B IN MAX)	5C
1F (FADER CONT)	00	83 (USER R-Y HUE)	0C	C1 (B OUT MIN)	5C
58 (ZOOM-SPEED1)	7A	84 (USER SHP LEVEL)	0A	C2 (B OUT DWN)	4A
59 (ZOOM-SPEED2)	35	85 (USER Y LEVEL)	0C	C3 (B DWN LMT)	1B
5A (ZOOM-SPEED3)	20	96 (SHUTTER IN)	B1	C4 (LL LMT)	06
5B (ZOOM-SPEED4)	53	97 (SHUTTER OUT)	8B	C5 (TM DIVID)	5C
5C (	00	98 (IRIS IN)	B0	C6 (BM DIVID)	39
5D	02	99 (IRIS OUT)	C0	C7 (DELAY TM)	06
60 (IRISREF NOR)	60	AC (BTM SLP R)	48	C8 (FAST TM)	40
61 (IRISREF PO)	60	AD (BTM SLP B)	78	C9 (OUT HYS OFF)	0E
62 (IRISREF SP)	60	AE (MDL SLP R)	60	CA (OUT B HYS)	07
6B (MAXSHUT PO (H))	00	AF (MDL SLP B)	40	D0 (SYSTEM)	01
6C (MAXSHUT PO (L))	CE	B0 (TOP SLP R)	66	E0 (DISPLAY MODE)	00
6D (MAXSHUT SP (H))	00	B1 (TOP SLP B)	18	EB (MODE)	00
6E (MAXSHUT SP (L))	E6	B2 (KEIKO R)	66	EC (AWB MODE3)	01
6F (REF WIDTH)	0C	B3 (KEIKO B)	18	ED (AWB MODE2)	00
70	00	B4 (BTM UP)	C2	EE (AWB MODE1)	00
71 (SHUT MULTI)	40	B5 (BTM DOWN)	A0	EF (CAM ALON)	00
73 (SHUT CONT 1)	06	B6 (MDL UP)	AD		
74 (SHUTSTEP MULTI)	02	B7 (MDL DWN)	96		
75 (IRIS OPEN)	20	B8 (TOP UP)	78		

Table 8-6.

Adjusting method:

- 1) Set the adjustment data at the various adjustment addresses to the initial values using the adjustment remote controller.
- 2) Change the adjustment address to store the last adjustment data in the memory.

8-2-5. Prime Oscillation Adjustment (CD-60 Board)

Measurement Point	Pin ③ of DT-77 board
Measuring Instrument	Frequency counter
Adjusting Element	CT122
Specified Value	14187500 $\pm$ 71 Hz

Note: Connect the frequency counter through a buffer amplifier (Oscilloscope, etc.) having high impedance and low capacitance.

Preparation:

- 1) Remove CD-60 board from the lens block.

Adjusting method:

- 1) Adjust to 14187500 $\pm$ 71 Hz with CT122.

8-2-6. PLL Adjustment (CD-60 Board)

Measurement Point	Pin ② of IC121
Measuring Instrument	Digital voltmeter
Adjusting Element	CT121
Specified Value	2.5 $\pm$ 0.2 Vdc

Preparation:

- 1) Remove CD-60 board from the lens block.

Adjusting method:

- 1) Adjust to 2.5 $\pm$ 0.2 Vdc with CT121.

8-2-7. PG CONT and Vsub Adjustment

1. PG CONT adjustment (VC-96 board)

Subject	Not needed
Measurement Point	Pin ① (PG CONT) of check point array
Measuring Instrument	Digital voltmeter
Adjustment page	F
Adjustment Address	13 (PG CONT)
Specified Value	(Voltage indicated by the imager) $\pm$ 0.1 Vdc

Adjusting method:

- 1) Select the page F and the address 13 with the adjustment remote controller.
- 2) Change the adjustment data to set the PG CONT voltage to (voltage indicated by the imager) $\pm$ 0.1 Vdc.
- 3) Change the adjustment address to store the adjustment data in the memory.

2. Vsub adjustment (VC-96 board)

Subject	Not needed
Measurement Point	Pin ④ (V SUB) of check point array
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	12 (V SUB)
Specified Value	(Voltage indicated by the imager) Vdc $\pm$ 3 %

Adjusting method:

- 1) Change the adjustment data at page F address 12 using the adjustment remote controller to set the Vsub voltage to (voltage indicated by the imager) Vdc $\pm$ 3 %.
- 2) Change the adjustment address to store the adjustment data in the memory.

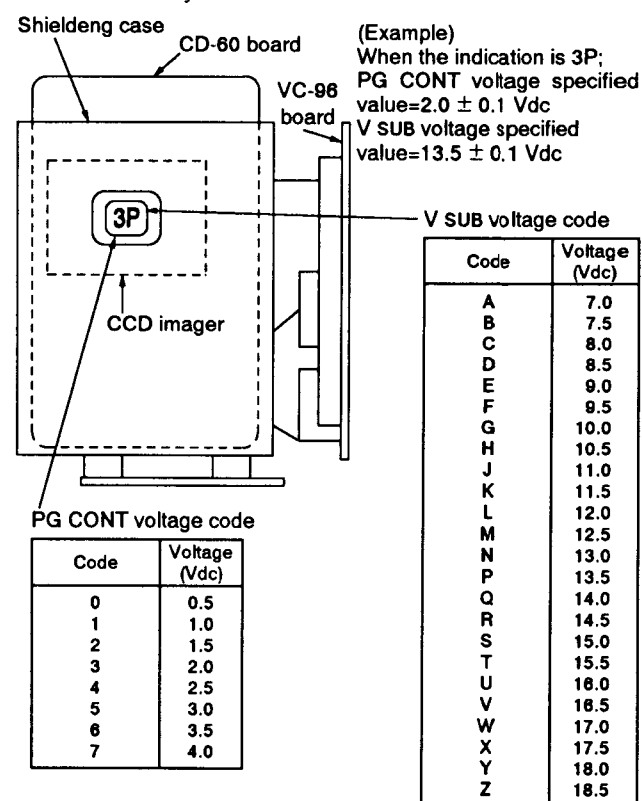


Fig. 8-12.

8-2-8. Iris Adjustment (VC-96 Board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement Point	Pin(B11) (IRIS OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	19 (Iris)
Specified Value	150 ± 10 mV

Adjusting method:

- 1) Select the page 5 and the address 00 with the adjustment remote controller, and set the data to 01.
- 2) Select the adjustment page F and the adjustment address 19.
- 3) Without attaching an ND filter, change the adjustment data with the adjustment remote controller to set the IRIS OUT signal level to 150 ± 10 mV.
- 4) Attach the ND filter 0.5 (0.4+0.1) to the front of the lens and confirm that there is a smooth change in the signal level.
- 5) Remove the ND filter and confirm that the signal level is 150 ± 20 mV.
- 6) Repeat 3) through 5) if the specified value is not met.
- 7) Change the adjustment address to store the adjustment data in the memory.

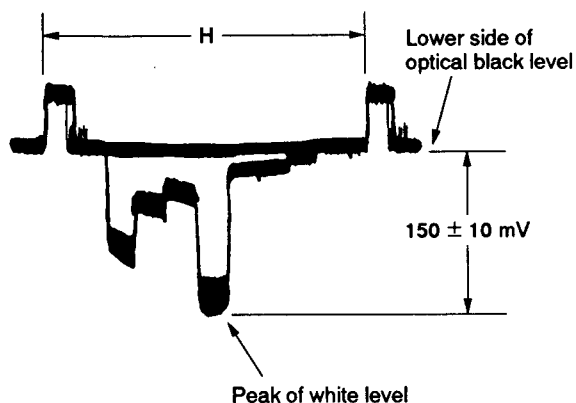


Fig. 8-13.

8-2-9. HALL Adjustment (VC-96 Board)

1. HALL Adjustment 1

Subject	White pattern standard picture frame
Measurement Point	CN655
Measuring Instrument	AF microcomputer data reading jig
Adjustment Page	F
Adjustment Address	87, 8B, 8A

Adjusting method:

- 1) Select the adjustment page F with the adjustment remote controller.
- 2) Select the adjustment address EB and set the adjustment data to 05. (HALL SENS level indication mode setting.)
Select the adjustment address 1B and set the adjustment data to 20.
Select the adjustment address 1C and set the adjustment data to 00.
- 3) Read the data indicated on the AF microcomputer data reading jig.
- 4) When the indicated data is over F8.
 - 1) Select the adjustment address 1C and change the adjustment data until the indication of AF microcomputer data reading jig is $F8 \pm 3$.
 - 2) Read the data of adjustment address 1C, and enter adjustment address 87.
- When the indicated data is below F8.
 - 1) Select adjustment address 87 and set the adjustment data to 00.
- 5) Read the data (W2) indicated on the AF microcomputer data reading jig, and enter adjustment address 8B.
- 6) Select adjustment address 1B and set the adjustment data to 00.
- 7) Read the data (W1) indicated on the AF microprocessor data reading jig and enter adjustment address 8A.
- 8) Perform "HALL adjustment 2".

2. HALL Adjustment 2

Subject	All black (cover lens with black cap)
Measurement Point	CN655
Measuring Instrument	AF microcomputer data reading jig.
Adjustment Page	F
Adjustment Address	88, 89, 1B (HALL GAIN), 1C (HALL OFFSET)

Note: Perform "HALL adjustment 1" before this adjustment.

Adjusting method:

- 1) Read the data (K1) indicated on the AF microcomputer data reading jig, and enter adjustment address 88.
- 2) Select adjustment address 1B and set the adjustment data to 20.
- 3) Read the data (K2) indicated on the AF microcomputer data reading jig, and enter adjustment address 89.
- 4) Convert the adjustment data W1 (address 8A) to decimal to obtain W1', the adjustment data W2 (address 8B) to decimal to obtain W2', the adjustment data K1 to decimal to obtain K1', and the adjustment data K2 to decimal to obtain K2'. (See table 8-4, Hexadecimal-decimal conversion table)
- 5) Obtain D' by the following formula.

$$D' = \frac{(208 + K1' - W1') \times \Delta K' + 3 \times \Delta W'}{\Delta K' + \Delta W'}$$

$$\left(\begin{array}{l} \Delta K' = K1' - K2' \\ \Delta W' = W2' - W1' \end{array} \right)$$

- 6) Convert D' to hexadecimal and obtain D. (when converting, if there is a fraction under decimal, round it off.)
- 7) Select the adjustment address 1B and set the adjustment data to 00.
- 8) Select the adjustment address 1C, and change the adjustment data until the indication of AF microcomputer data reading jig is equal to D value.
- 9) Select the adjustment address 1B, and change the adjustment data until the indication of AF microcomputer data reading jig is 03.
- 10) Perform "HALL adjustment 3".

3. HALL Adjustment 3

Subject	White pattern standard picture frame
Measurement Point	CN655
Measuring Instrument	AF microcomputer data reading jig.
Adjustment Page	F
Adjustment Address	1B (HALL GAIN), 1C (HALL OFFSET)

Note: Perform "HALL adjustment 2" before this adjustment.

Adjusting method:

- 1) Read the data (Wo) indicated on the AF microcomputer data reading jig.
- 2) When Wo value is from CF to D1, perform the adjustment after 15).
- 3) convert Wo to decimal to obtain Wo'.
- 4) Obtain E' by the following formula.

$$E' = \frac{(208 \times \Delta K') + (Wo' \times \Delta W')}{\Delta K' + \Delta W'}$$

$$\left(\begin{array}{l} \Delta K' = K1' - K2' \\ \Delta W' = W2' - W1' \end{array} \right)$$

- 5) Convert E' to hexadecimal and obtain E.
- 6) Select the adjustment address 1C, and change the adjustment data until the indication of AF microcomputer data reading jig is equal to E value.
- 7) When E value is equal to DO, perform the adjustment after 9).
- 8) Select the adjustment address 1B and change the adjustment data until the indication of AF microcomputer data reading jig is DO.
- 9) Cover the lens with black cap.
- 10) Read the data (Ko) indicated on the AF microcomputer data reading jig.
- 11) When Ko Value is from 01 to 05, perform the adjustment after 15).
- 12) Select the adjustment address 1B and change the adjustment data until the indication of AF microcomputer data reading jig is 03.
- 13) Remove the black cap.
- 14) Confirm that the indication of AF microcomputer data reading jig is from CF to D1.
- 15) Select the adjustment address EB and set the adjustment data to 00.
- 16) Change the adjustment address to store the adjustment data in the memory.

8-2-10. AGC Adjustment (VC-96 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (B3) (Y LPF OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	1A (AGC)
Specified Value	$180 \pm 5 \text{ mV}$

Adjusting method:

- 1) Select the page 5 and the address 00 with the adjustment remote controller, and set the data to 01.
- 2) Select the adjustment page F and the adjustment address 1A.
- 3) Change the adjustment data with the adjustment remote controller to set the Y LPF signal level to $180 \pm 5 \text{ mV}$.
- 4) Change the adjustment address to store the adjustment data in the memory.

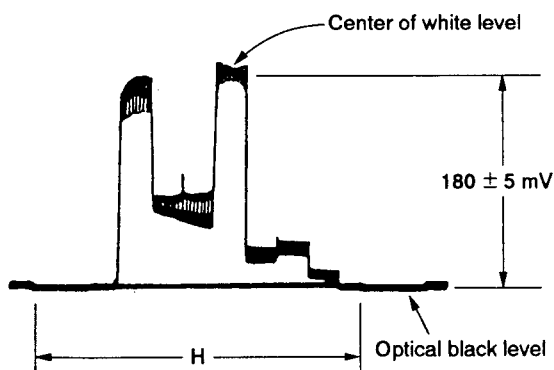


Fig. 8-14.

8-2-11. Matrix Adjustment (VC-96 Board)

1. Y1 Gain Adjustment

Subject	Color bar chart standard picture frame
Measurement point	Pin (A5) (VAP OUT) of check point array
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	07 (Y1 Gain)
Specified value	$Y_0-Y_1=0 \pm 5 \text{ mV}$

Preparation:

- 1) Connect Pin (B8) (Y2 GAIN) of check point array and GND with a jumper wire.
- 2) Connect Pin (B5) (VAP SLICE) of check point array and GND with a jumper wire.

Adjusting Method:

- 1) Select the adjustment page F with the adjustment remote controller.
- 2) Select the adjustment address 0F with the adjustment remote controller and set the adjustment data to 00. (VAP GAIN: MAX)
- 3) Select the adjustment address 07.
- 4) Change the adjustment data and set the Y_0-Y_1 waveform to be a straight line. (There should not be difference.)
- 5) Change the adjustment address to store the adjustment data in the memory.
- 6) Remove the jumper wires.
- 7) Perform "Y2 Gain adjustment."

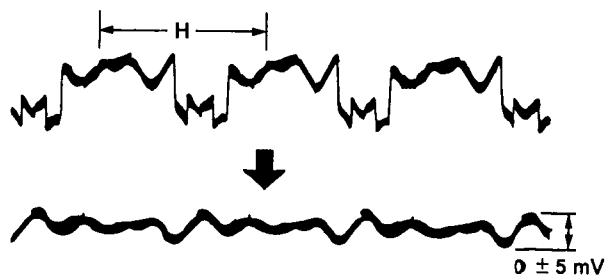


Fig. 8-15.

2. Y2 Gain Adjustment

Subject	Color bar chart standard picture frame
Measurement point	Pin (A5) (VAP OUT) of check point array
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	06 (Y2 GAIN)
Specified value	$Y_1 - \frac{Y_0 + Y_2}{2} = 0 \pm 5 \text{ mV}$

Preparation:

- 1) Connect pin (B5) (VAP SLICE) of check point array and GND with a jumper wire.

Adjusting Method:

- 1) Select the adjustment page F with the adjustment remote controller.
- 2) Select the adjustment address 0F with the adjustment remote controller and set the adjustment data to 00. (VAP GAIN: MAX)
- 3) Select the adjustment address 06.
- 4) Change the adjustment data and set the $(Y_1 - \frac{Y_0 + Y_2}{2})$ waveform to be a straight line. (There should not be difference.)
- 5) Select the adjustment address 0F with the adjustment remote controller and set the adjustment data to 90.
- 6) Change the adjustment address to store the adjustment data in the memory.
- 7) Remove the jumper wire.

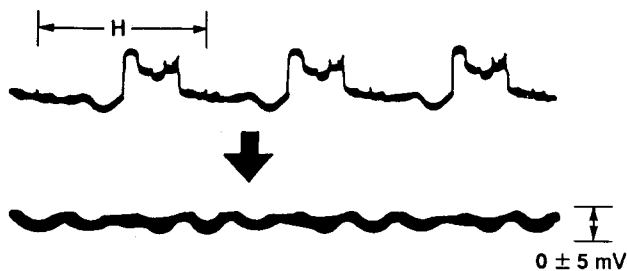


Fig. 8-16.

8-2-12. YH Level Adjustment (VC-96 Board)

Subject	Color bar chart standard picture frame
Measurement point	Pin (A6) (TP) of check point array
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	08 (YH GAIN)
Specified value	$0 \pm 5 \text{ mV}$

Adjusting Method:

- 1) Select the page 5 and the address 00 with the adjustment remote controller and set the data to 01.
- 2) Select the adjustment page F and the adjustment address 08.
- 3) Change the adjustment data with the adjustment remote controller and set the waveform to be straight line. (There should not be difference)
- 4) Change the adjustment address to store the adjustment data in the memory.

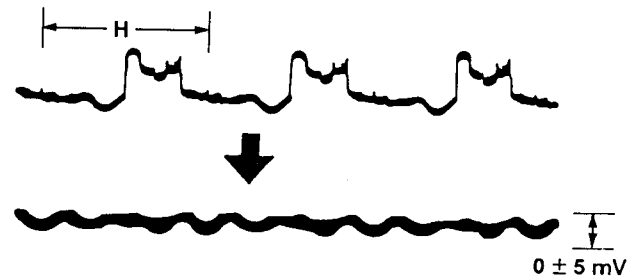


Fig. 8-17.

8-2-13. C1 Gain Adjustment (VC-96 Board)

Subject	Color bar standard picture frame
Measurement Point	CH1(X): pin ⑩ of MX-10 board (B-Y) CH2(Y): pin ⑩ of MX-10 board (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Page	F
Adjustment Address	03 (C1 GAIN)
Specified Value	Separate color luminance points become one.

Adjusting method:

- 1) Select the page 5 and the address 00 with the adjustment remote controller and set the data to 01.
- 2) Select the adjustment page F and the adjustment address 03.
- 3) Change the adjustment data so that the two separate color luminance points become one respectively.
- 4) Change the adjustment address to store the adjustment data in the memory.

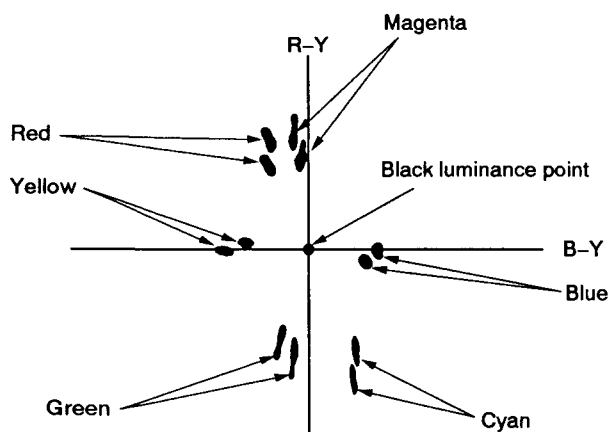


Fig. 8-18.

8-2-14. Sync Level Adjustment (VC-96 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin ⑧ (CAM Y) of check point array or pin ① (Y OUT) of CN307
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	16 (SYNC LEVEL)
Specified Value	150 ± 5 mVp-p

Adjusting method:

- 1) Select the adjustment page F and the adjustment address 16 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to set the sync level to 150 ± 5 mVp-p.
- 3) Change the adjustment address to store the adjustment data in the memory.

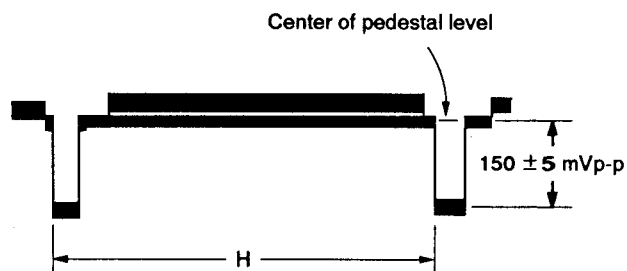


Fig. 8-19.

8-2-15. Setup Adjustment (VC-96 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8)(CAM Y) of check point array or pin ①(Y OUT) of CN307
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	10 (SET UP)
Specified Value	$15 \pm 5 \text{ mV}$

Note: 1) and 2) are steps taken to reduce noise.

Adjusting method:

- 1) Select the adjustment page F and the address 0D (SHP LEVEL) with the adjustment remote controller, and enter FF as the adjustment data after making a note of the adjustment data for this address.
- 2) Set the address 18 (MAX GAIN) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
- 3) Set the adjustment address to 10 with the adjustment remote controller.
- 4) Change the adjustment data with the adjustment remote controller to set the setup level to $15 \pm 5 \text{ mV}$.
- 5) Set the adjustment address to 0D and enter the adjustment data recorded in 1).
- 6) Set the adjustment address to 18 and enter the adjustment data recorded in 2).
- 7) Change the adjustment address to store the adjustment data in the memory.

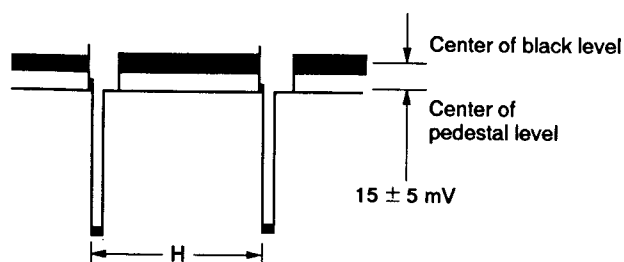


Fig. 8-20.

8-2-16. White Clip Adjustment (VC-96 Board)

Subject	Color var chart standard picture frame
Measurement Point	Pin (A8)(CAM Y) of check point array or pin ①(Y OUT) of CN307
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	15 (WHITE CLIP)
Specified Value	$420 \pm 10 \text{ mV}$

Adjusting method:

- 1) Select the adjustment page F and the adjustment address 0E with the adjustment remote controller, and make a note of the adjustment data for this address.
- 2) Set the adjustment data to FF with the adjustment remote controller. (Y level is maximum.)
- 3) Set the adjustment address to 15 with the adjustment remote controller.
- 4) Change the adjustment data with the adjustment remote controller to set the white clip level to $420 \pm 10 \text{ mV}$.
- 5) Set the adjustment address to 0E and enter the adjustment data recorded in 1).
- 6) Change the adjustment address to store the adjustment data in the memory.

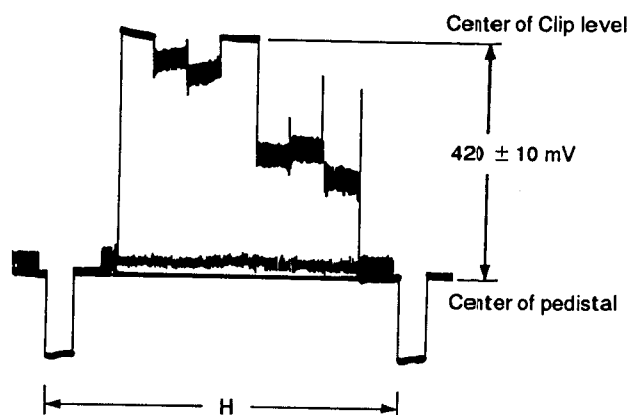


Fig. 8-21.

8-2-17. Y Level Adjustment (VC-96 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A8) (CAM Y) of check point array or pin ① (Y OUT) of CN307
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	0E (Y LEVEL)
Specified Value	$330 \pm 5 \text{ mV}$

Adjusting method:

- 1) Select the page 5 and the address 00 with the adjustment remote controller and set the data to 01.
- 2) Select the adjustment page F and the adjustment address 0E.
- 3) Change the adjustment data with the adjustment remote controller to set the Y signal level to $330 \pm 5 \text{ mV}$.
- 4) Change the adjustment address to store the adjustment data in the memory.

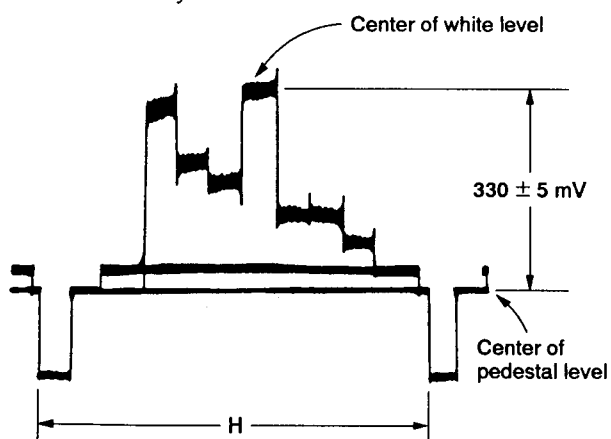


Fig. 8-22.

8-2-18. Max. Gain Adjustment (VC-96 Board)

Subject	Color bar chart standard picture frame
Filter	ND filters 1.0 (two) and 0.3 (two)
Measurement Point	Pin (A8) (CAM Y) of check point array or pin ① (Y OUT) of CN307
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	18 (MAX GAIN)
Specified Value	$150 \pm 5 \text{ mV}$

Adjusting method:

- 1) Cover the lens with the ND filter 2.6 (1.0+1.0+0.3+0.3).
- 2) Select the adjustment page F and the adjustment address 18 with the adjustment remote controller.
- 3) Change the adjustment data with the adjustment remote controller to set the Y signal level to $150 \pm 5 \text{ mV}$.
- 4) Change the adjustment address to store the adjustment data in the memory.

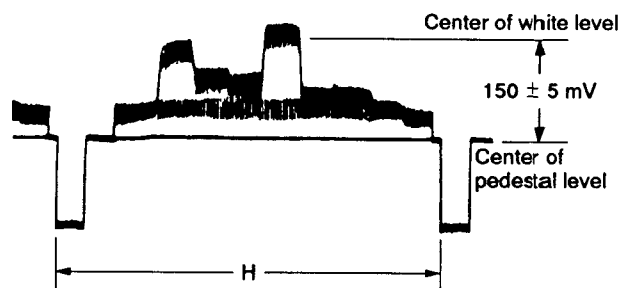


Fig. 8-23.

8-2-19. H Aperture Adjustment (VC-96 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin ① (Y OUT) of CN307
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	0D (SHP LEVEL)
Specified Value	$60 \pm 5 \text{ mV}$

Adjusting method:

- 1) Focus the camera and set the aperture level (lower peak between green and white) to maximum.
- 2) Select the page 5 and address 00 with the adjustment remote controller and set the data to 01.
- 3) Select the adjustment page F and the adjustment address 0D.
- 4) Change the adjustment data to set the lower peak between green and white to $60 \pm 5 \text{ mV}$.
- 5) Change the adjustment address to store the adjustment data in the memory.

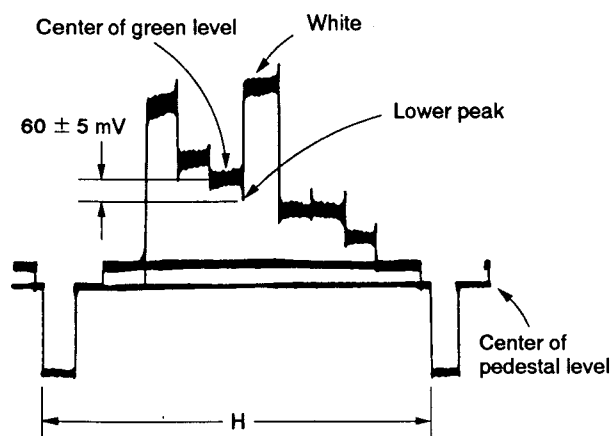


Fig. 8-24.

8-2-20. Chroma Level Adjustment (VC-96 Board)

Subject	Color bar chart standard picture frame
Measurement point	Pin ⑦ (WB-G) of check point array
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	11 (C LEVEL)
Specified value	$320 \pm 20 \text{ mV}$

Adjusting method:

- 1) Select the page 5 and the address 00 with the adjustment remote controller and set the data to 01.
- 2) Select the adjustment page F and the adjustment address 11.
- 3) Change the adjustment data with the adjustment remote controller to set the WB-G signal level to $320 \pm 20 \text{ mV}$.
- 4) Change the adjustment address to store the adjustment data in the memory.

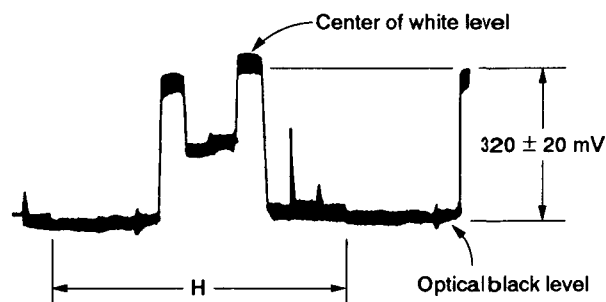


Fig. 8-25.

8-2-21. Burst Level Adjustment (VC-96 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin ⑩ (CAM C) of check point array or pin ③ (C OUT) of CN307
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	17 (BURST LEVEL)
Specified Value	$150 \pm 5 \text{ mVp-p}$

Adjusting method:

- 1) Select the adjustment page F and the adjustment address 17 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to set the burst level to $150 \pm 5 \text{ mVp-p}$.
- 3) Change the adjustment address to store the adjustment data in the memory.

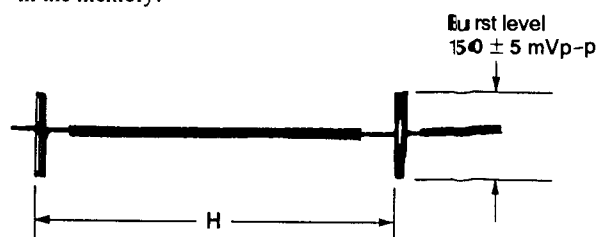


Fig. 8-26.

8-2-22. Burst Phase Check

Subject	All black (cover lens with black cap)
Measurement Point	VIDEO output terminal
Measuring Instrument	Vectorscope
Specified Value	$135^{\circ} \pm 2^{\circ}$

Checking method:

- 1) Confirm that the burst luminance point phase is $135^{\circ} \pm 2^{\circ}$.

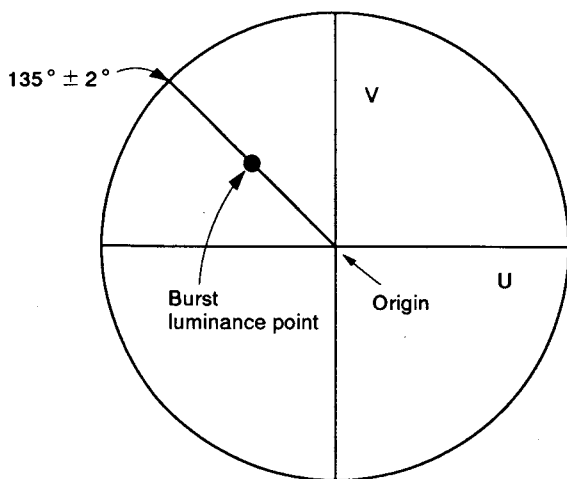


Fig. 8-27.

8-2-23. Pre- White Balance Adjustment (Method Using Vectorscope)

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	05 (R GAIN) 04 (B GAIN)
Specified Value	The center of the white luminance point is within a circle with a diameter of 1 mm centered around the origin.

Adjusting method:

- 1) Select the adjustment page F and the adjustment address 05 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to match the white luminance point with the origin.
- 3) Set the adjustment address to 04.
- 4) Change the adjustment data to match the white luminance point with the origin.
- 5) Repeat steps 1) through 4).
- 6) Change the adjustment address to store the adjustment data in the memory.

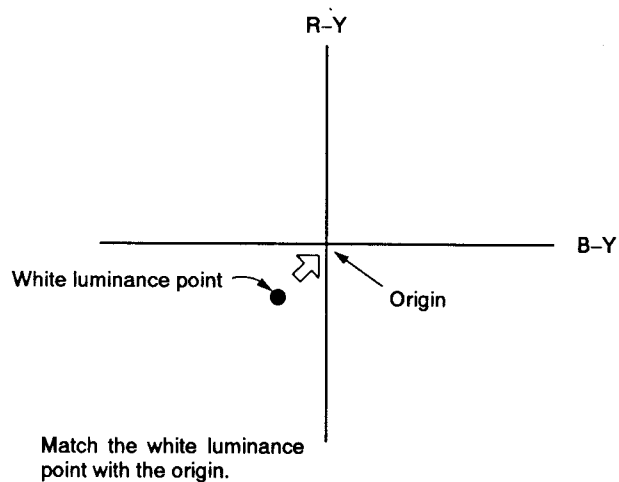


Fig. 8-28.

**8-2-24. Pre- White Balance Adjustment
(Method Using Oscilloscope) (VC-96 Board)**

Subject	White pattern standard picture frame
Measurement Point	Pin ① (CAM C) of check point array or pin ③ (C OUT) of CN307
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	05 (R GAIN) 04 (B GAIN)
Specified Value	Minimum chroma signal amplitude.

Adjusting method:

- 1) Select the adjustment page F and the adjustment address to 05 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to minimize the chroma signal amplitude.
- 3) Set the adjustment address to 04.
- 4) Change the adjustment data to minimize the chroma signal amplitude.
- 5) Repeat steps 1) through 4).
- 6) Change the adjustment address to store the adjustment data in the memory.

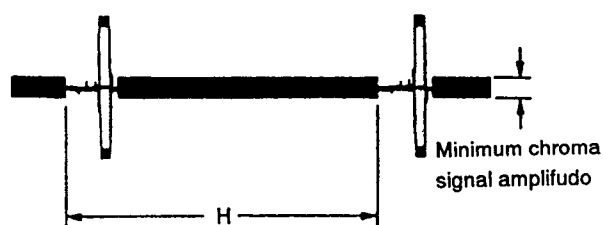


Fig. 8-29.

8-2-25. Color Reproduction Adjustment (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	09 (R-Y GAIN) 0A (B-Y GAIN) 0B (R-Y HUE) 0C (B-Y HUE)
Specified Value	All color luminance points are within color reproduction frame. (☐)

Note: Confirm that "Burst Level Adjustment" and "Pre- White Balance Adjustment" have been completed.

Adjusting method:

- 1) Adjust the phase and gain of the vectorscope to set the burst luminance points to the designated position on the color reproduction frame.
- 2) Select the page 5 and the address 00 with the adjustment remote controller and set the data to 01.
- 3) Select the adjustment page F.
- 4) Change the adjustment data at the various adjustment addresses using the adjustment remote controller until all color luminance points are within the color reproduction frame (☐).
- 5) Change the adjustment address to store the adjustment data in the memory.

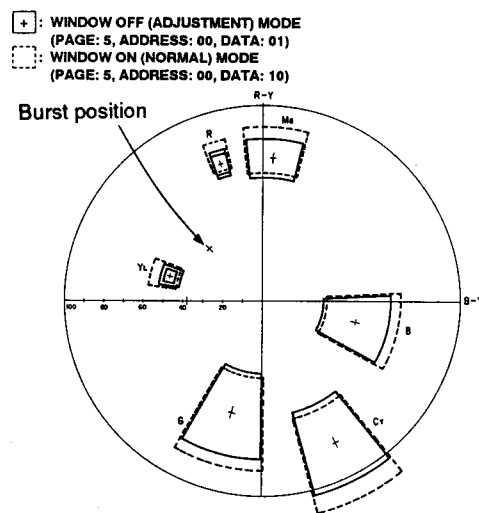


Fig. 8-30.

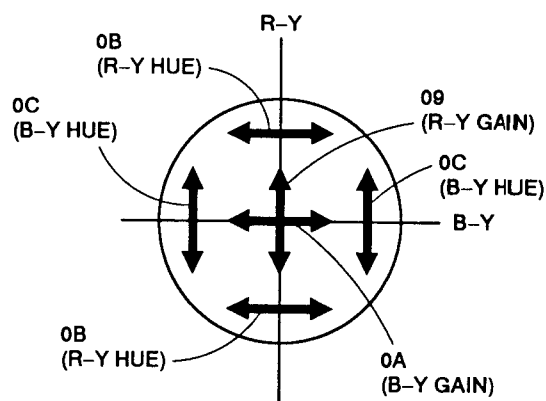


Fig. 8-31. Adjustment address and direction of luminance point movement

8-2-26. Color Reproduction Adjustment (Method Using Oscilloscope)

Preparation:

- 1) Select the page 5 and the address 00 with the adjustment remote controller and set the data to 01.

1. Gain adjustment (VC-96 board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin ① (CAM C) of check point array or pin ③ (C OUT) of CN307
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	09 (R-Y GAIN) 0A (B-Y GAIN)
Specified Value	Red level: 291 ± 20 mVp-p Yellow level: 191 ± 12 mVp-p

Note: Confirm that "Indoor White Balance Adjustment" is completed.

Adjusting method:

- 1) Select the adjustment page F with the adjustment remote controller.
- 2) Set the adjustment address to 0A with the adjustment remote controller and set the adjustment data to 90.
- 3) Set the adjustment address to 0B and set the adjustment data to 80.
- 4) Set the adjustment address to 0C and set the adjustment data to 50.
- 5) Set the adjustment address to 09 and change the adjustment data to set the chroma signal "red" level to 291 ± 20 mVp-p.
- 6) Set the adjustment address to 0A and change the adjustment data to set the chroma signal "yellow" level to 191 ± 12 mVp-p.
- 7) Repeat steps 5) and 6).
- 8) Change the adjustment address to store the adjustment data in the memory.
- 9) Perform "Hue Adjustment".

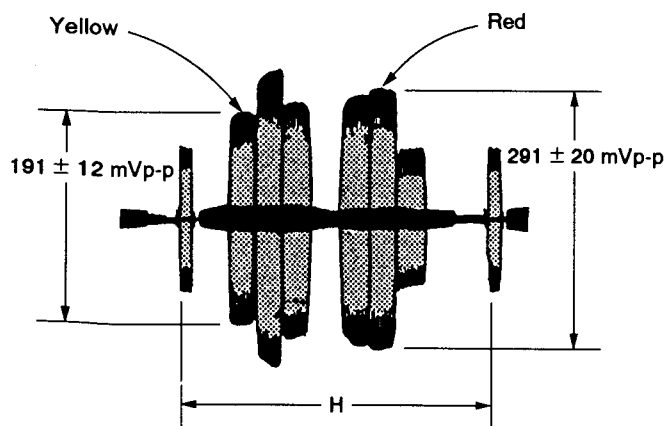


Fig. 8-32.

2. Hue adjustment (VC-96 board)

Subject	Color bar chart standard picture frame
Measurement Point	CH1(X): Pin ③ of MX-10 board (B-Y) CH2(Y): Pin ③ of MX-10 board (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Page	F
Adjustment Address	0B (R-Y HUE) 0C (B-Y HUE)
Specified Value	Various color luminance points within color reproduction frame.

Note: Make sure that "Indoor White Balance Adjustment" is completed.

Adjusting method:

- 1) Match the "black" luminance point on the oscilloscope with the origin of the color reproduction frame.
- 2) Select the adjustment page F with the adjustment remote controller.
- 3) Change the adjustment data at adjustment addresses 0B and 0C with the adjustment remote controller to bring the various color luminance points into the color reproduction frame.
- 4) Check the hue reproduced on the monitor TV and fine adjust the adjustment data at adjustment addresses 0B and 0C if necessary.
- 5) Set the oscilloscope to the normal mode and connect it to Pin ③ of CN307 and confirm that the specified value of "1. Gain Adjustment" is satisfied. Change the data at the adjustment address 09 and 0A if the specified value is not met.
- 6) Change the adjustment address to store the adjustment data in the memory.

WINDOW OFF (ADJUSTMENT) MODE
(PAGE: 5, ADDRESS: 00, DATA: 01)

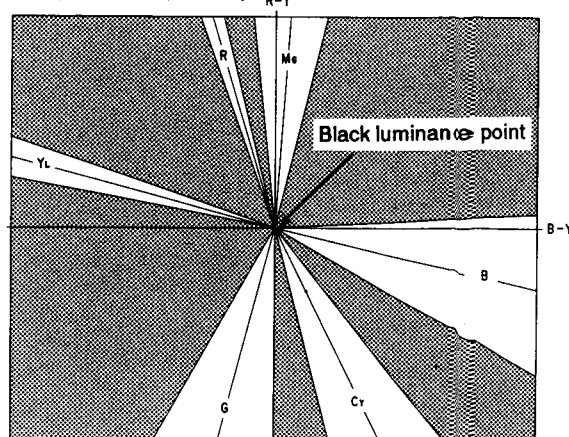


Fig. 8-33.

8-2-27. AE OFFSET adjustment (VC-96 board)

Subject	All back (Cover lens with a black cap.)
Measurement point	CN655
Measuring instrument	AF microcomputer data reading jig
Adjustment page	F
Adjustment address	1E (AE OFFSET)
Specified value	Minimum value of 01 to 06

Adjusting Method:

- 1) Select adjustment page F and address EB with the adjustment remote controller, and set the adjustment data to 13.
(IRIS CONT level indication mode setting.)
- 2) Select the adjustment address 1E.
- 3) Change the adjustment data until the indication on the AF microcomputer data reading jig is the minimum value in the range of 01 to 06.
- 4) Read the data (D1) indicated on the AF microcomputer data reading jig.
- 5) Change the adjustment address to store the adjustment data in the memory.
- 6) Perform "Standard AE level and Program AE level adjustment."

8-2-28. Standard AE level and Program AE level adjustment (VC-96 board)

Subject	Color bar chart standard picture frame
Measurement point	CN655
Measuring instrument	AF microcomputer data reading jig
Adjustment page	F
Adjustment address	60 (IRIS REF NOR) 61 (IRIS REF PO) 62 (IRIS REF SP)
Specified value	$D60-D1 \geq 59$

Note: Perform "AE OFFSET adjustment" before this adjustment to obtain D1.

Adjusting method:

- 1) Select the page 5 and the address 00 with the adjustment remote controller, and set the data to 01.
- 2) Select the adjustment page F and the adjustment address 60.
- 3) Read the indication on the AF microcomputer data reading jig and enter this data (D60) into the adjustment address 60.
($D60-D1 \geq 59$)
- 4) Convert D60 to decimal to obtain D60'.
- 5) Obtain D61' and D62' by the following formula.

$$D61' = D60' - 12$$

$$D62' = D60' - 12$$
- 6) Convert D61' and D62' to hexadecimal and call respect values D61 and D62.
- 7) Select the adjustment address 61 and 62, and enter the adjustment data D61 and D62 into respective addresses.
- 8) Change the adjustment address to store the adjustment data in the memory.

8-2-29. Auto White Balance Adjustment

Note: Be sure to first perform "Preset Adjustment" followed by "Auto White Balance Adjustment".

1. Preset adjustment (VC-96 board)

Subject	White pattern standard picture frame
Adjustment page	F
Adjustment address	90 (R3200 MSB), 91 (R3200 LSB) 92 (B3200 MSB), 93 (B3200 LSB) 94 (G3200 MSB), 95 (G3200 LSB)

Adjusting method:

- 1) Select the page 5 and the address 00 with the adjustment remote controller after turning the power OFF and ON, and set the data to 01.
- 2) Turn off the auto focus with FOCUS button, and wait at least for 5 seconds.
- 3) Select the adjustment page F and the adjustment address EE and set the adjustment data to 01. (3200k data fetch 1 mode setting)
- 4) Change the adjustment address to store 3200k data 1.
- 5) Select the adjustment address EE and set the adjustment data to 23. (3200K data fetch 2 mode setting)
- 6) Change the adjustment address to store 3200k data 2.
- 7) Confirm that the indicated data on the adjustment remote controller is changed, and that the indicated address is 95.
- 8) Select the adjustment address EE and set the adjustment data to 00.
- 9) Perform the following "Auto white balance adjustment".

2. Auto white balance adjustment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measuring instrument	Vectorscope
Measuring point	VIDEO IN/OUT terminal
Adjustment page	F
Adjustment address	01 (R CONT), 02 (B CONT)

Adjusting method:

- 1) Select the adjustment address EE and set the adjustment data to DO with the adjustment remote controller. (WB DIRECT mode setting)
- 2) Cover the lens with C14 filter.
- 3) Change the adjustment data at the adjustment addresses 01 and 02 alternately with the adjustment remote controller to match the white luminance point with the specified point.
- 4) Select the adjustment address EE and set the adjustment data to 00.
- 5) Change the adjustment address to store the adjustment data in the memory.
- 6) Set HOLD switch of the adjustment remote controller to the off position and then set to the on position.

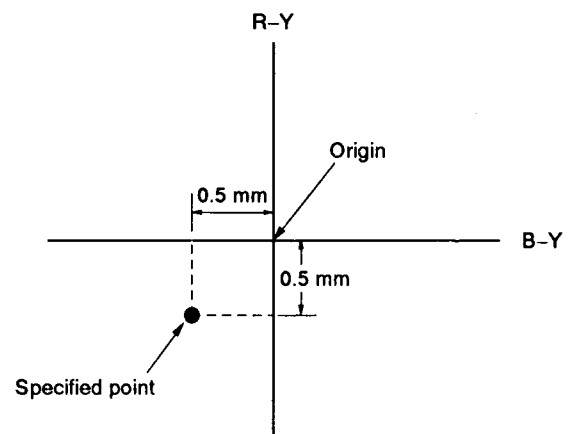


Fig. 8-34.

8-2-30. SHUTTER IN/OUT Adjustment (VC-96 Board)

Subject	White pattern standard picture frame
Filter	ND filter 0.4 and 0.1
Measuring point	CN655
Measuring instrument	AF microcomputer data reading jig.
Adjustment page	F
Adjustment address	97 (SHUTTER OUT) 96 (SHUTTER IN)

Adjusting method:

- 1) Select the page 5 and the address 00 and set the data 01 with the adjustment remote controller.
- 2) Select the adjustment address EB and set the adjustment data to 11.
(Shutter data indication mode setting)
- 3) Change the adjustment address.
- 4) Set the shutter speed to 1/2000 with SHUTTER SPEED button.
- 5) Set up the portrait mode (👤) with PROGRAM AE button.
- 6) Cover the lens with ND filter 0.5 (0.4+0.1), and wait for 2 seconds.
- 7) Read the data (D97) indicated on the AF microcomputer data reading jig and enter adjustment address 97.
(D97 should be 61 to 81.)
- 8) Convert D97 to decimal to obtain D97'.
- 9) Obtain D96' by the following formula.
 $D96' = D97' + 10$
- 10) Convert D96' to hexadecimal, and enter it into the adjustment address 96.
- 11) Cover the lens and ND filter 0.5 with black cap, and wait for 2 seconds.
- 12) Confirm that the data indicated on the AF microcomputer data reading jig is FF.
- 13) Select the adjustment address EB and set the adjustment data to 00.
- 14) Change the adjustment address to store the adjustment data in the memory.

8-2-31. Indoor White Balance Check (VC-96 Board)

Subject	White pattern standard picture frame
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Vectorscope

Preparation:

- 1) Set HOLD switch of the adjustment remote controller to the off position.

Checking method:

- 1) Press the white balance button to select the indoor white balance mode. (✱ mark is displayed on LCD.)
- 2) Confirm that the center of the white luminance point is within the standard circle.

Note: When using a vectorscope, adjust the gain and phase of the vectorscope so that burst luminance point moves to the burst position of the color reproduction frame.

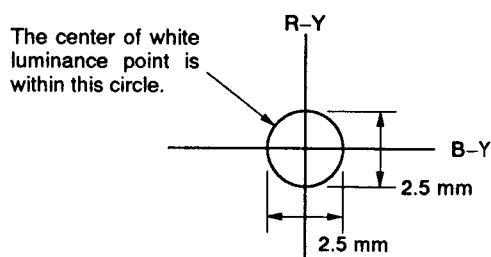


Fig. 8-35.

8-2-32. Outdoor White Balance Check (VC-96 Board)

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	VIDEO OUT terminal
Measuring Instrument	Vector scope

Preparation:

- 1) Set HOLD switch of the adjustment remote controller to the off position.

Checking method:

- 1) Cover the lens with the C14 filter for color temperature correction.
- 2) Press the white balance button to select the outdoor white balance mode. (* mark is displayed on LCD.)
- 3) Confirm that the center of the white luminance point is within the standard circle.

Note: When using a vectorscope, adjust the gain and phase of the vectorscope so that burst luminance point moves to the burst position of the color reproduction frame.

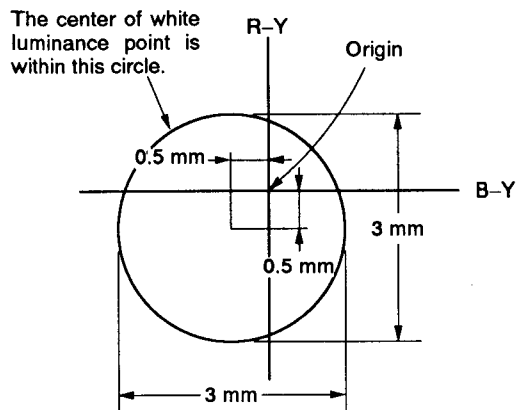


Fig. 8-36.

8-2-33. Auto White Balance Check (VC-96 Board)

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filters 1.0 and 0.3
Measurement point	VIDEO OUT terminal
Measuring instrument	Vectorscope

Checking method:

- 1) Select the adjustment page F and the adjustment address EC with the adjustment remote controller and set the adjustment data to 02. (Auto white balance check mode setting)
- 2) Change the adjustment address to store the adjustment data in the memory.
- 3) Set HOLD switch of the adjustment remote controller to the off position.
- 4) Set the white balance to the auto white balance mode.
- 5) Cover the lens with the C14 filter and confirm that the white luminance point matches with the origin in about 5 seconds.
- 6) Confirm that the white luminance point is within the circle 1.
- 7) Remove the C14 filter.
- 8) Cover the lens with ND filter 1.3 (1.0+0.3) and wait for 5 seconds.
- 9) Confirm that the white luminance point is within the circle 2.
- 10) Set HOLD switch of the adjustment remote controller to the on position.
- 11) Select the adjustment page F and the adjustment address EC and set the adjustment data to 01.
- 12) Change the adjustment address to store the adjustment data in the memory.

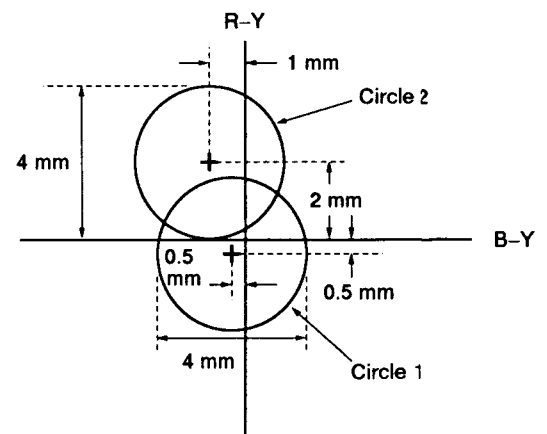


Fig. 8-37.

8-3. DIGITAL TITLER SYSTEM ADJUSTMENT

Preparations:

Open the cabinet (with the camera and video blocks connected state).

1. Open the VC-96 board.
2. Connect 12-pin extension cord between CN305 on the VC-96 board and W702 on the VA-70 board.
3. Connect 4-pin extension cord between CN307 on the VC-96 board and W701 on the VA-70 board.
4. Open the VA-70 board.
5. Open the CT-40 board.
6. Connect 20-pin extension cord between CN705 on the CT-40 board and CN703 on the VA-70 board.

8-3-1. 4FSC Frequency Adjustment (CT-40 Board)

Mode	E-E
Signal	Non-signal
Measurement point	Emitter of Q707
Measuring instrument	Frequency counter
Adjustment element	CT702
Specified value	4433619 ± 50 Hz

Connection:

- 1) Connect Pin ⑲ of IC704 and Pin ⑰ of CN705 (VIDEO 4.9V) with a jumper wire.
- 2) Connect Pin ③ of IC704 and Pin ⑰ of CN705 with 10 k Ω resistor.
- 3) Connect Pin ③ of IC704 and GND with 22 k Ω resistor.

Adjusting Method:

- 1) Set POWER switch to VTR (PLAYER) position.
- 2) Set IN/OUT select switch to OUT position, when IN/OUT select switch is installed.
- 3) Adjust to 4433619 ± 50 Hz with CT702.
- 4) Set POWER switch to CAMERA position.



Fig. 8-38.

8-3-2. Controller Frequency Adjustment (CT-40 Board)

Subject	All white pattern
Measurement point	Pin ⑦ of IC707
Measuring instrument	Oscilloscope
Adjustment element	CT701
Specified value	1.5 ± 0.3 μ sec

Adjusting Method:

- 1) Press DATA SCREEN button.
- 2) Press COLOR/MODE button until **T** mark is displayed on the monitor TV screen.
- 3) Press TITLE 1 button.
- 4) Press MEMORY button.
- 5) Press COLOR/MODE button until all white title is displayed on the monitor TV screen.
- 6) Adjust to 1.5 ± 0.3 μ sec with CT701.

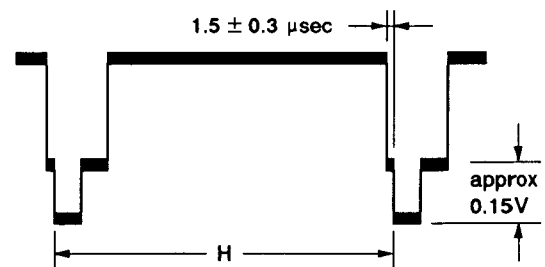


Fig. 8-39.

8-3-3. Title A/D Threshold Level Adjustment (CT-40 Board)

Mode	E-E
Measurement point	CH1: Pin ② of IC703 CH2: Pin ① of IC703
Measuring instrument	Oscilloscope (DC range, 0.2V/DIV)
Adjustment element	RV703
Specified value	$0.215 \pm 0.03V$

Adjusting method:

- 1) Set POWER switch to VTR (PLAYER) position.
- 2) Input the staircase signal to Pin ⑨ of S201 pattern on VA-70 board.
- 3) Adjust the threshold level to 0.215V with RV703.
- 4) Disconnect the staircase signal.
- 5) Set POWER switch to CAMERA position.

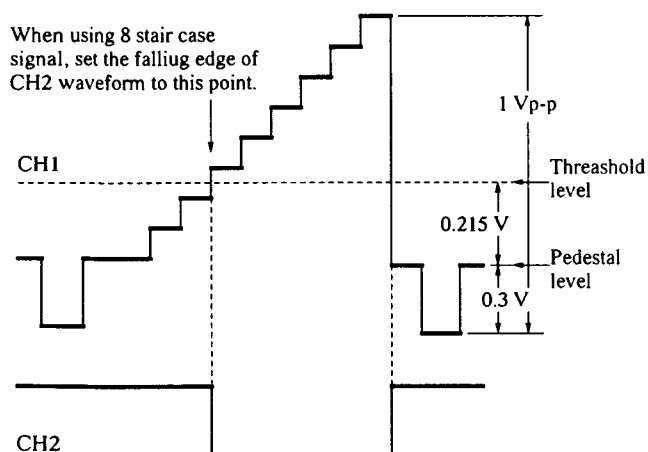


Fig. 8-40.

8-3-4. Title Chroma Phase Adjustment (CT-40 board)

Subject	All white pattern
Measurement point	VIDEO OUT terminal
Measuring instrument	Vertoscope
Adjustment element	RV702
Specified value	$60^\circ \pm 2^\circ$

Adjusting Method:

- 1) Press DATA SCREEN button.
- 2) Press COLOR/MODE button until **T** mark is displayed on the monitor TV screen.
- 3) Press TITLE 1 button.
- 4) Press MEMORY button.
- 5) Press COLOR/MODE button until a magenta title displayed on the monitor TV screen.
- 6) Adjust the cyan luminance point to $60^\circ \pm 2^\circ$ with RV702.

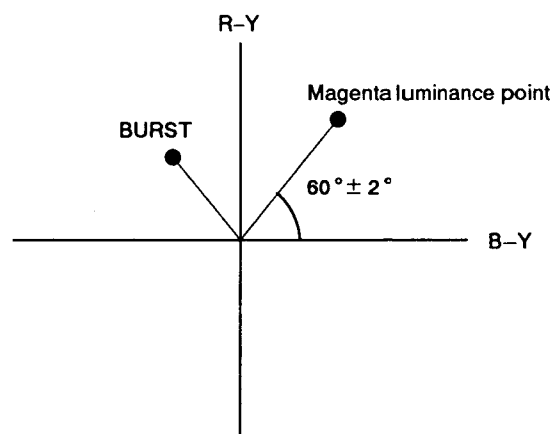


Fig. 8-41.

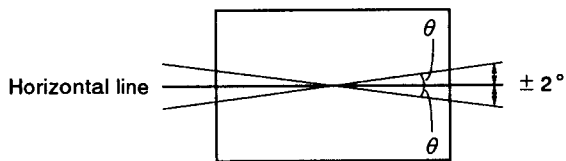
8-4. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (TYPE A) (VF-27 BOARD)

8-4-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 8-42.

Adjustment method:

- 1) By turning RV904 (BRIGHT), adjust for a luminance level which provides appropriate visibility of the CRT screen.
- 2) Loosen the DY (deflection yoke) tightening nut.
- 3) Make the image horizontal by rotating DY.
- 4) Retighten the DY tightening nut. (Do not tighten excessively.)



Specified value: Image orientation within $\pm 2^\circ$ of horizontal line.

Fig. 8-42.

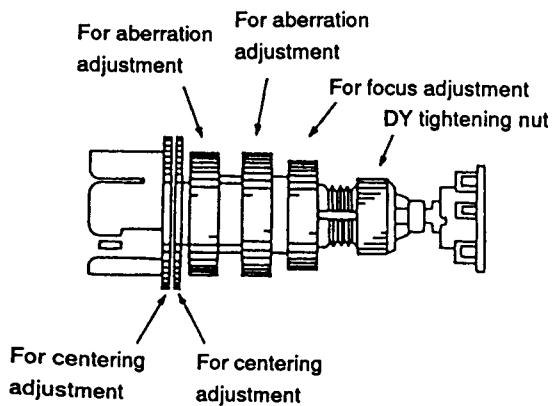


Fig. 8-43.

8-4-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 8-44.

Adjustment method:

- 1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 8-44.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

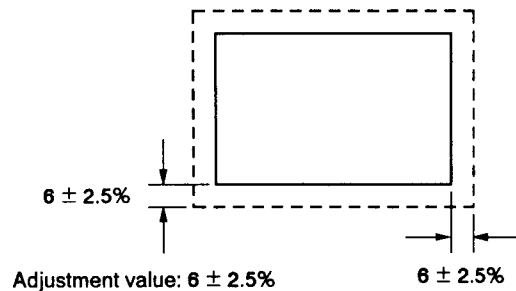


Fig. 8-44.

8-4-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion

Adjustment method:

- 1) Adjust for optimum focus using the focus ring. (See Fig. 8-43.)

8-4-4. Aberration Adjustment

Mode	E-E
Signal	Dot pattern
Specified Value	See Fig. 8-45.

Adjustment method:

- 1) Use the aberration adjustment rings to adjust any trailing dots to within 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
- 2) If off center, repeat the Centering Adjustment.

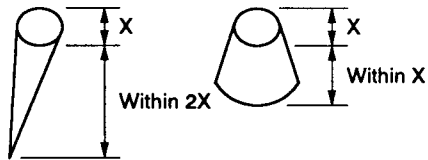


Fig. 8-45.

8-4-5. Horizontal Oscillation Frequency Adjustment (VF-27 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP)
Measurement Point	Pin ⑤ of CN904
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV901
Specified Value	2.60 ± 0.05 Vdc

Adjustment method:

- 1) Adjust to 2.60 ± 0.05 Vdc using RV901.

8-4-6. Horizontal Amplitude Adjustment (VF-27 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	C911
Specified Value	$6 \pm 3.2\%$

Adjustment method:

- 1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV902.
- 2) Rotate RV904 to set the brightness to the normal level.
- 3) Short or open the pattern (A) of the H size adjustment capacitor (C911) to provide horizontal overscans of $6 \pm 3.2\%$ (total of left and right). (See Fig. 8-46.)

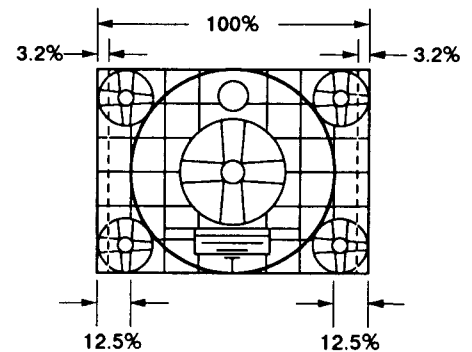
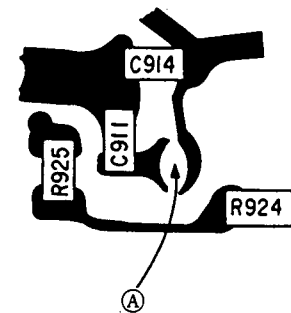


Fig. 8-46.



VF-27 Board
(conductor side)

A section	H size
Open	Large
Short	Small

Fig. 8-47.

8-4-7. Vertical Amplitude Adjustment (VF-27 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV902
Specified Value	$6 \pm 3.2\%$

Adjustment method:

- 1) By turning RV902, adjust vertical overscan to $6 \pm 3.2\%$ (upper and lower total).

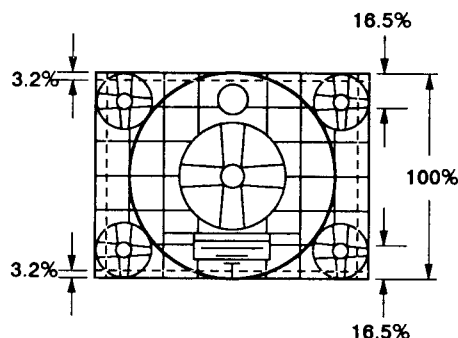


Fig. 8-48.

8-4-8. Brightness, Contrast Adjustments (VF-27 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Brightness: RV904 Contrast: RV903

Adjustment method:

- 1) Adjust RV904 and RV903 alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

8-4-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

Values should conform to specifications given in 8-4-6. Horizontal Amplitude Adjustment and 8-4-7. Vertical Amplitude Adjustment. If not, readjust accordingly, and repeat 8-4-8. Brightness, Contrast Adjustments. In this case, focus needs to be checked. If the image is not clear, perform 8-4-3. Focus Adjustment and 8-4-4. Aberration Adjustment.

8-5. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (TYPE B) (VF-26 BOARD)

8-5-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 8-50.

Adjustment method:

- 1) Adjust the volume array ① (BRIGHT) for appropriate brightness on CRT screen. (See Fig. 8-51.)
- 2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 8-49.)
- 3) Make a picture horizontal by turning the DY.
- 4) Retighten the nut. (Do not tighten excessively.)

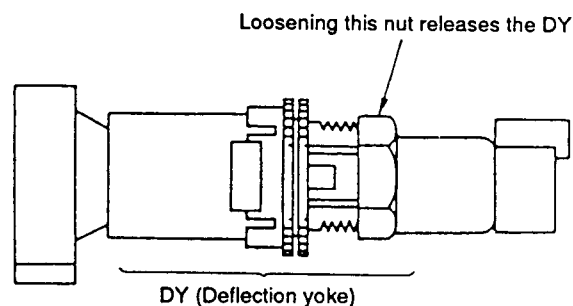
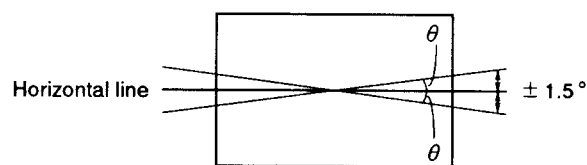


Fig. 8-49.



Specified value: Image orientation within $\pm 1.5^\circ$ of horizontal line.

Fig. 8-50.

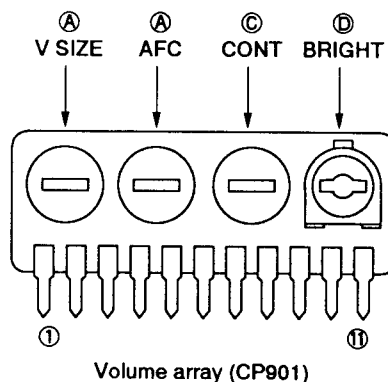


Fig. 8-51.

8-5-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 8-53.

Adjustment method:

- 1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 8-52.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

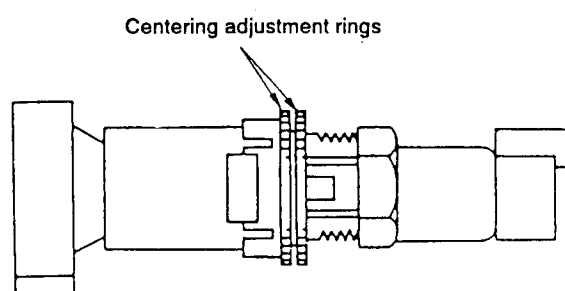


Fig. 8-52.

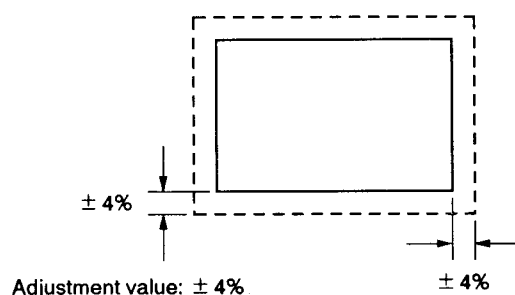


Fig. 8-53.

8-5-3. AFC Adjustment (VF-26 Board)

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C915 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	Volume array ⑤ (AFC)
Specified Value	2.6 ± 0.2 Vdc

Adjustment method:

- 1) Adjust volume array ⑤ (AFC) for 2.6 ± 0.2 Vdc. (See Fig. 8-51.)

8-5-4. Horizontal Amplitude Adjustment (VF-26 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	C905
Specified Value	$6 \pm 3.2\%$

Adjustment method:

- 1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating volume array ④ (V SIZE). (See Fig. 8-51.)
- 2) Rotate volume array ⑤ (BRIGHT) to set the brightness to the normal level.
- 3) Short or open the pattern A of the H size adjustment capacitor (C905) to provide horizontal overscans of $6 \pm 3.2\%$ (total of left and right). (See Fig. 8-55.)

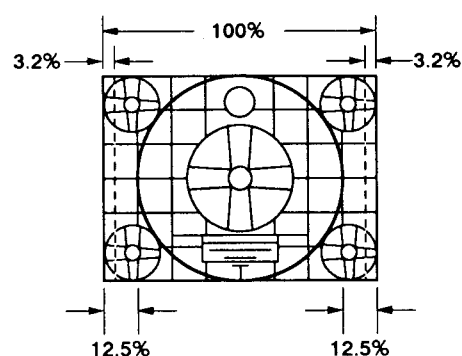
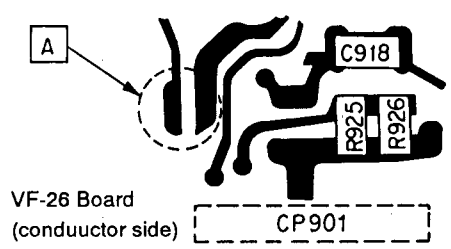


Fig. 8-54.



A section	H size
Open	Large
Short	Small

Fig. 8-55.

8-5-5. Vertical Amplitude Adjustment (VF-26 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Volume array ㉞ (V SIZE)
Specified Value	6 ± 3.2%

Adjustment method:
1) By turning volume array ㉞ (V SIZE), adjust vertical overscan to 6 ± 3.2% (upper and lower total). (See Fig. 8-51.)

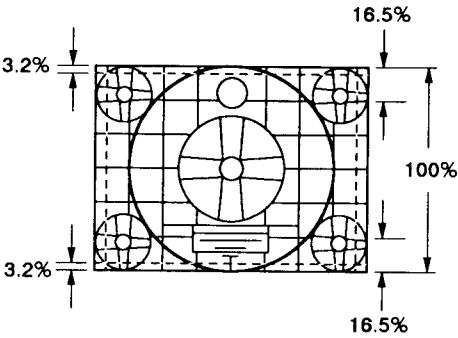


Fig. 8-56.

8-5-6. Focus Adjustment (VF-26 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV901

Adjustment method:
1) Adjust to the best focus point with RV901.

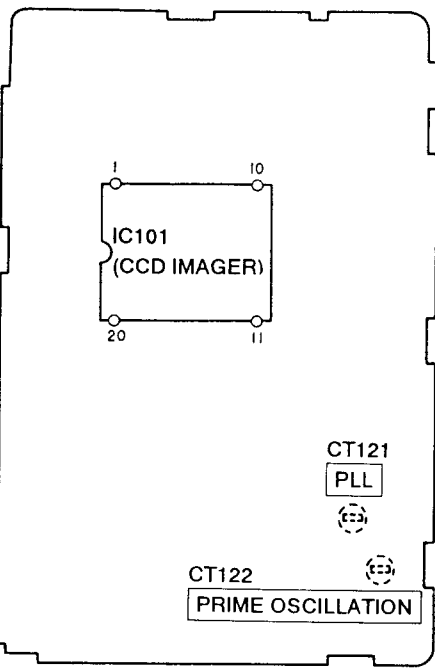
8-5-7. Brightness, Contrast Adjustments (VF-26 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Brightness: Volume array ㉟ (BRIGHT) Contrast: Volume array ㊸ (CONT)

Adjustment method:
1) Adjust volume array ㉟ (BRIGHT) and ㊸ (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.) (See Fig. 8-51.)

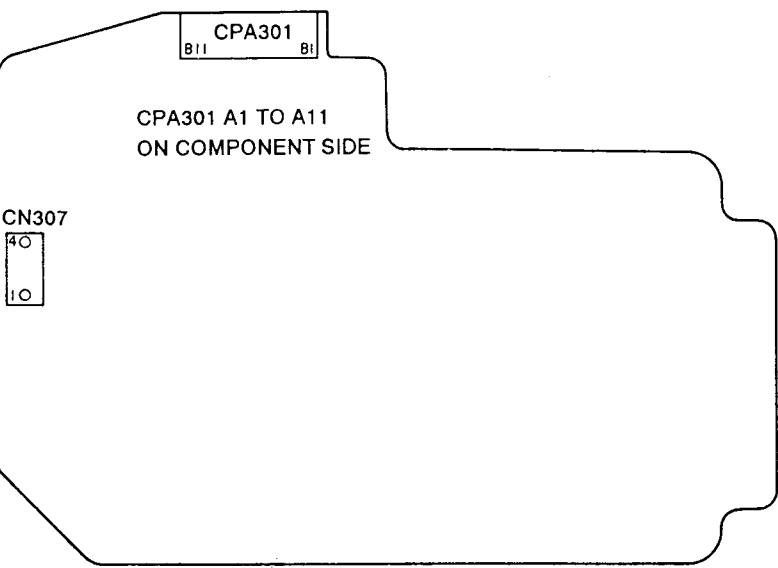
8-6. ARRANGEMENT DIAGRAMS FOR ADJUSTMENT PARTS

CD-60 BOARD (CONDUCTOR SIDE)

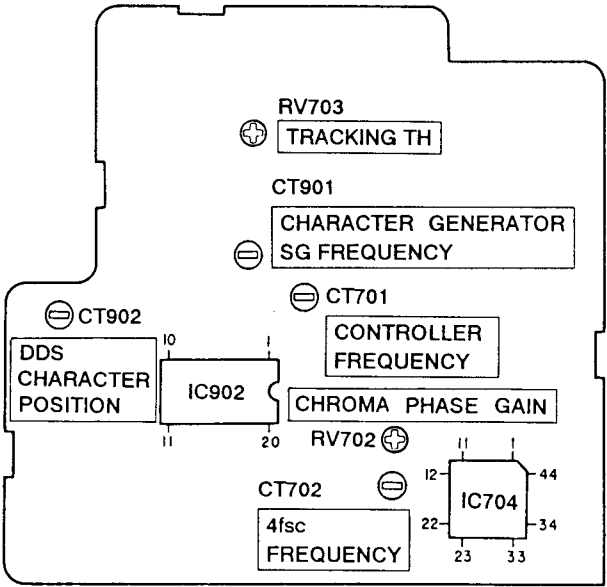


CT121 AND CT122
ON COMPONENT SIDE

VC-96 BOARD (CONDUCTOR SIDE)

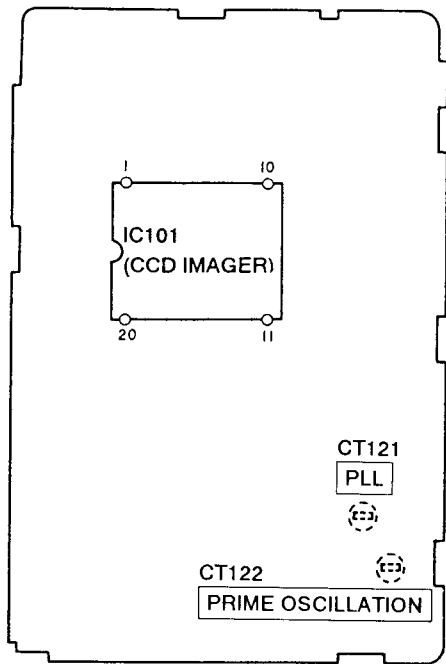


CT-40 BOARD (COMPONENT SIDE)
(Also illustrated on page 306.)



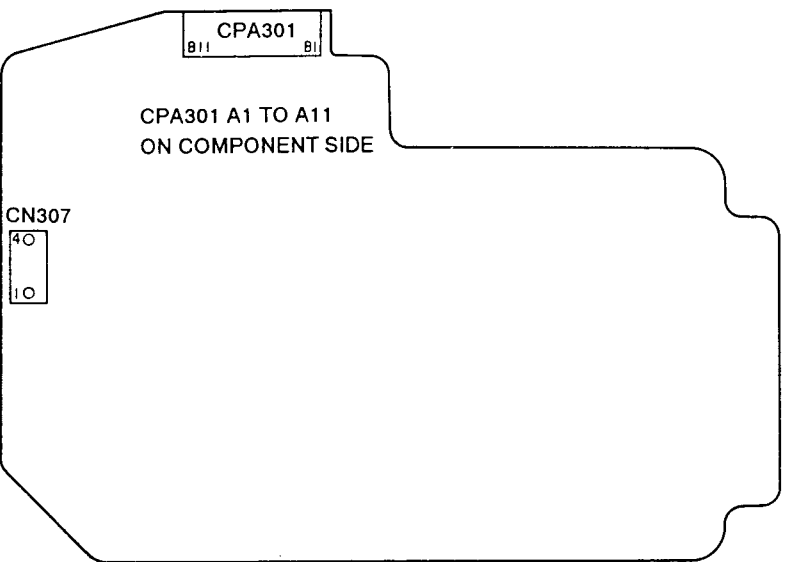
8-6. ARRANGEMENT DIAGRAMS FOR ADJUSTMENT PARTS

CD-60 BOARD (CONDUCTOR SIDE)

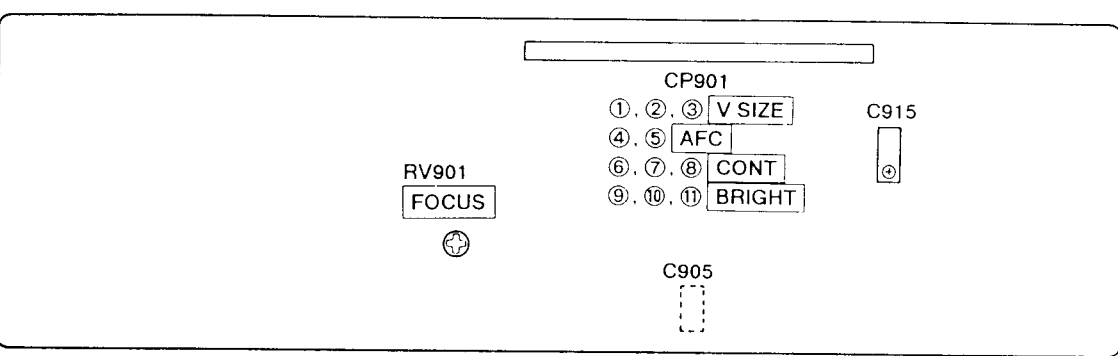


CT121 AND CT122
ON COMPONENT SIDE

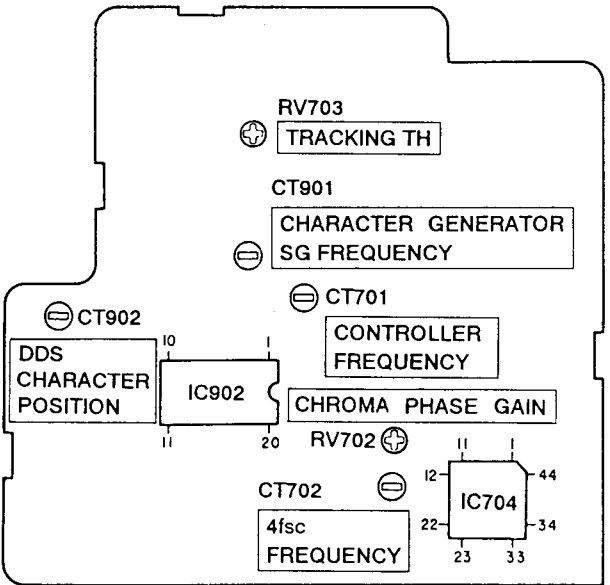
VC-96 BOARD (CONDUCTOR SIDE)



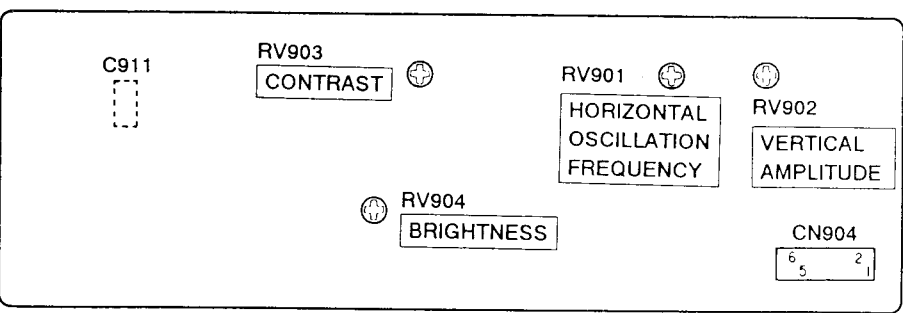
VF-26 BOARD (COMPONENT SIDE)



CT-40 BOARD (COMPONENT SIDE)
(Also illustrated on page 306.)



VF-27 BOARD (COMPONENT SIDE)



SECTION 9

MECHANICAL ADJUSTMENTS

For Mechanical Adjustments

Refer to mechanical adjustment (8 mm Video MECHANICAL ADJUSTMENT MANUAL III) manual for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-972-732-11)

For setting of the track shift mode, however, refer to the following.

9-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

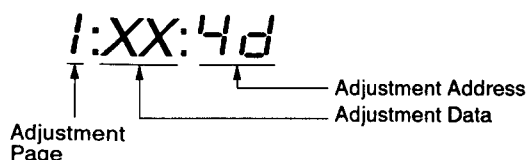
[Setting Method]

- 1) Set the adjustment commander to the HOLD ON side.
- 2) Press EDIT SEARCH + button once, and select page 1.
- 3) Select the adjustment address 4D with FF or REW button.
- 4) Set to 3X with PLAY and STOP button. (Setting of track shift mode)

Note: 3X should be the number from 31 to 3F. (To display "3X" with PLAY and STOP button is simple to shift.)

(When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).

- 5) Set to the HOLD OFF side in order to set the normal mode.



- 1X: TEST 1
- 2X: TEST 2 ('CH Playback)
- 3X: TEST 3 (Shift mode)
- 4X: Shift release

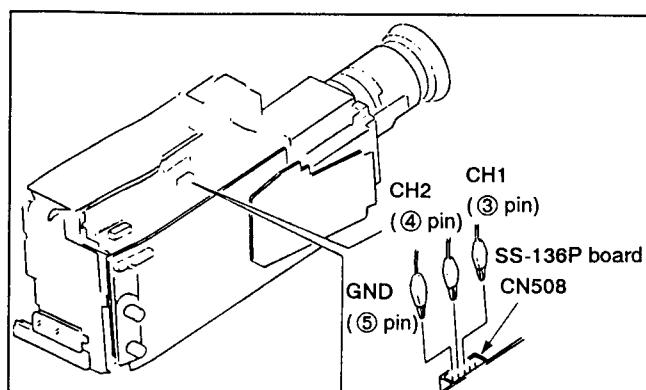


Fig.9-1.

9-2. PREPARATION FOR ADJUSTMENT

- 1) Clean the tape running surfaces (tape guide, drum, capstan shaft, pinch roller.)
- 2) Connect to the oscilloscope.
CH1: SS-136P board CN508 pin ③ (PB RF)
CH2: SS-136P board CN508 pin ④ (SWP)
- 3) Play back the tracking alignment tape (WR5-1CP) (8-967-995-07).
- 4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. When not flat, make adjustment as follows. (Refer to Figs. 9-1 and 9-2.)

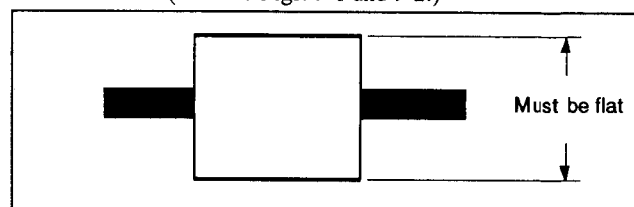


Fig.9-2.

SECTION 10 VIDEO BLOCK ADJUSTMENTS

During the adjustments, see the arrangement diagram for adjustment parts from page 306.

10-1. PRE-ADJUSTMENT PREPARATIONS (VIDEO BLOCK)

Use the following measuring instruments for adjustment of the VTR block.

10-1-1. Equipment to be Used

- 1) Monitor TV
- 2) Dual trace oscilloscope of over 20 MHz band, incorporates delay mode. (Use 10:1 probe unless otherwise specified.)
- 3) Frequency counter
- 4) Pattern generator with video output terminal
- 5) Digital voltmeter
- 6) Audio generator
- 7) Audio level meter
- 8) Audio distortion meter
- 9) Audio attenuator
- 10) Regulated power supply
- 11) Alignment tapes
 - Tracking adjustment (WR5-1CP)
Parts Code: 8-967-995-07
 - Video frequency characteristics adjustment (WR5-6C)*¹
Parts Code: 8-967-995-17
 - Operation check (WR5-4CL)*²
Parts Code: 8-967-995-56
 - (WR5-5CSP)*³
Parts Code: 8-967-995-47
 - AFM stereo operation check (WR5-9CS)
Parts Code: 8-967-995-28
- Note:** *1 WR5-2C (8-967-995-16) is also available.
*2 WR5-3CL (8-967-995-36) is also available.
*3 WR5-4CSP (8-967-995-46) is also available.
- 12) Adjustment remote controller (Modification of RM-95)
- 13) Extension code (20 PIN)
Parts Code: J-6082-063B

10-1-2. Connection of Equipment

Unless otherwise specified, adjustments are made with the measuring instrument connected as shown in Fig. 10-1.

- Camera/video power switch VTR (PLAYER) position
- REC mode (SP/LP) switch SP position

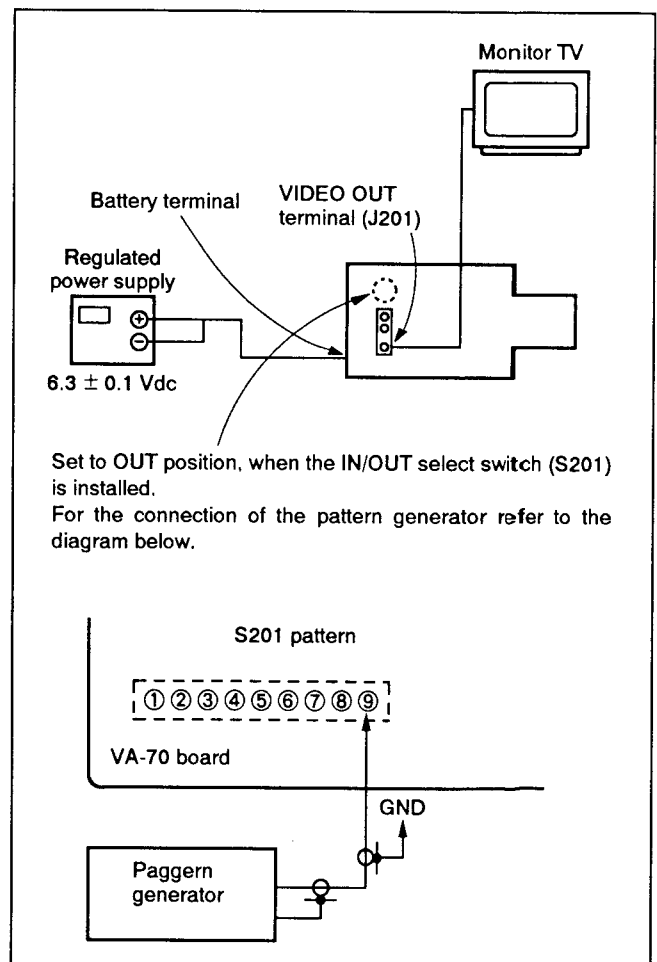


Fig. 10-1.

10-1-3. How to Set the REC Mode In the Model without REC Switch

1. REC key forbidden accept mode cancel
 1. Connect the adjustment remote controller to the REMOTE terminal.
 2. Turn on the power
 3. Turn on the HOLD switch of the adjustment remote controller.
 4. Select the page 1 address 00, and set the data to 01. (Protect mode cancel)
 5. Select the page D address 02, and set the data to 03. (REC key forbidden accept mode cancel)
 6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

The REC key is accepted through the above procedure. The adjustment remote controller may be removed, hereafter.

2. REC mode setting
 1. Connect the K OUT 3 pattern and K IN 3 pattern on VK-16P board with a jumper wire until the VTR is set to REC mode.
3. Procedure after completed the adjustment

Be sure to return the mode to REC key forbidden accept mode after adjustment.

 1. Connect the adjustment remoter controller to the REMOTE terminal.
 2. Turn on the power.
 3. Turn on HOLD switch of the adjustment remote controller.
 4. Select the page 1 address 00, and set the data to 01. (Protect mode cancel)
 5. Select the page D address 02, and set the data to 02. (Setting of the REC key forbidden accept mode)
 6. Press PAUSE button of the adjustment remote controller. (Write to the non-volatile memory)

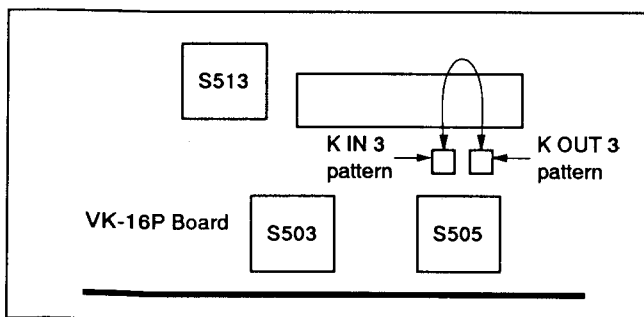


Fig. 10-2.

10-1-4. Note on Adjustments

The video block adjustment can be made without the camera block except "Battery Down Adjustment" of system control adjustment and "Switching position adjustment" of servo system adjustment. Remove the following three connectors in case of removing the camera block.

1. 2 PIN connector on CAMERA DC/DC convertor.
2. CN307 (4-pin) on VC-96 board
3. CN305 (12-pin) on VC-96 board

The cabinet (L) is not required for the video block adjustment. When removing the cabinet (L), remove the following connector.

1. CN601 (8-pin) on VA-70 board.
2. CN401 (6-pin) on VA-70 board.
3. CN503 (6-pin) on SS-136P board.

The cabinet (R) is not required for the video block adjustment. When removing the cabinet (R), remove the following connector.

1. CN501 (14-pin) on VK-16P board.

There is no problem even if the CT-40 board is removed when adjusting the video circuit. However, when adjusting the CT-40 board (digital titler/character generator circuit), use the extension cord (20-pin).

10-1-5. Set-up for Adjustment

Since the video signal obtained from the pattern generator is used as the adjusting signal for the electrical adjustment, this video output signal should meet the required specifications. Connect an oscilloscope to the VIDEO OUT terminal of the VA-70 board and make sure that the amplitude of the video SYNC signal is approximately 0.3V, that the amplitude of the video image is approximately 0.7V, that the burst signal amplitude is approximately 0.3V with flat characteristics, and that the signal level ratio between the burst signal and "Red" signal is 0.30:0.66. The video signal (color bars) used for VTR block electrical adjustment are shown in Fig. 10-3.

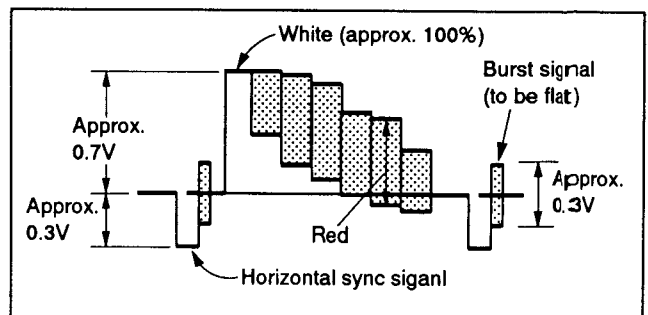


Fig. 10-3. Color bar signal of pattern generator

10-1-6. Alignment Tapes

The following alignment tapes are available.

Use the tape indicated in the signal column; however, in case there is no type indication in the signal column, use any tape for operation check.

Tape	REC mode	Type	Tape speed	Contents		Use
				Video area	PCM area	
Tracking WR5-1CP	L	MP	SP	CH2: 1 MHz tape pass adjustment signal		Tape pass adjustment
Video freq. characteristics WR5-6C	L	MP	LP	RF sweep: 0 to 10 MHz Marker: 1, 3.58, 5.5, 7MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-4CSP or WR5-5CSP	L	MP	SP	• Video signal Color bar: 4 min. Monoscope: 4 min. • Audio signal (AFM) 400 Hz, 60% modulation	• Audio signal (PCM) Monoscope: 20 Hz 20sec 400 Hz 20sec 14 kHz 20sec - Repeat four times. - Color bar: 1 kHz 4 min.	Operation check
Operation check (LP mode) WR5-4CL	L	MP	LP	• Video signal Color bar: 4 min. Monoscope: 4 min. • Audio signal (AFM) 400 Hz, 60% modulation		
AFM stereo operation check WR5-9CS	L	MP	SP	• Video signal Color bar: 4 min. Monoscope: 4 min. • Audio signal (AFM) Stereo section (color bar) L ch: 400 Hz, R ch: 1 kHz $\left(\begin{array}{l} \text{L+R:} \\ 1.5 \text{ MHz, } \pm 60 \text{ kHz DEV} \\ \text{L-R:} \\ 1.7 \text{ MHz, } \pm 30 \text{ kHz DEV} \end{array} \right)$ Bilingual section (monoscope) MAIN: 400 Hz (1.5 MHz, ± 60 kHz DEV) SUB: 1 kHz (1.7 MHz, ± 30 kHz DEV)	• Audio signal (PCM) 400 Hz: 8 min.	AFM stereo operation check

Note: Recording mode

L Conventional mode
E Hi8 (high band) mode

Tape type

MP Particle type metal tape
ME Evaporated type metal tape

Table 10-1.

75% color bar signal recorded on an alignment tape is shown in Fig. 10-4.

Note: Measured at VIDEO OUT terminal. (75 Ω termination)

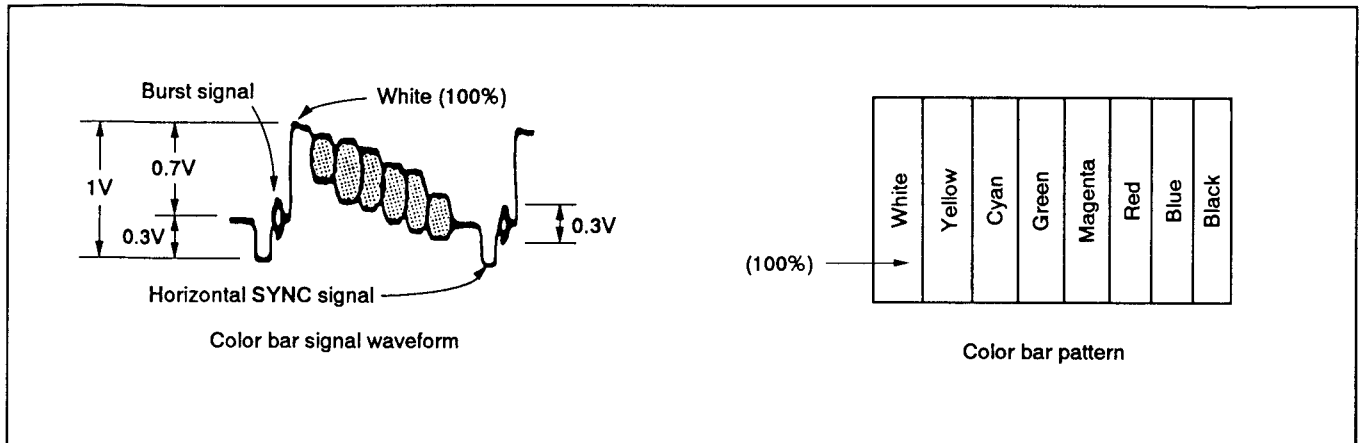


Fig. 10-4. Alignment tape color bar signal

10-1-7. I/O Level and Impedance

1. E, Australian model

[I/O level and Impedance]

Video input/output phone jack
Input signal: 1 Vp-p, 75 Ω unbalanced, negative sync

Audio input/output phone jack
Input level: -7.5 dBs (0 dBs=0.775 Vrms)
Input impedance: More than 47 k Ω
Output level: -7.5 dBs
(at output impedance 47 k Ω)
Output impedance: More than 2.2 k Ω

2. AEP, UK model

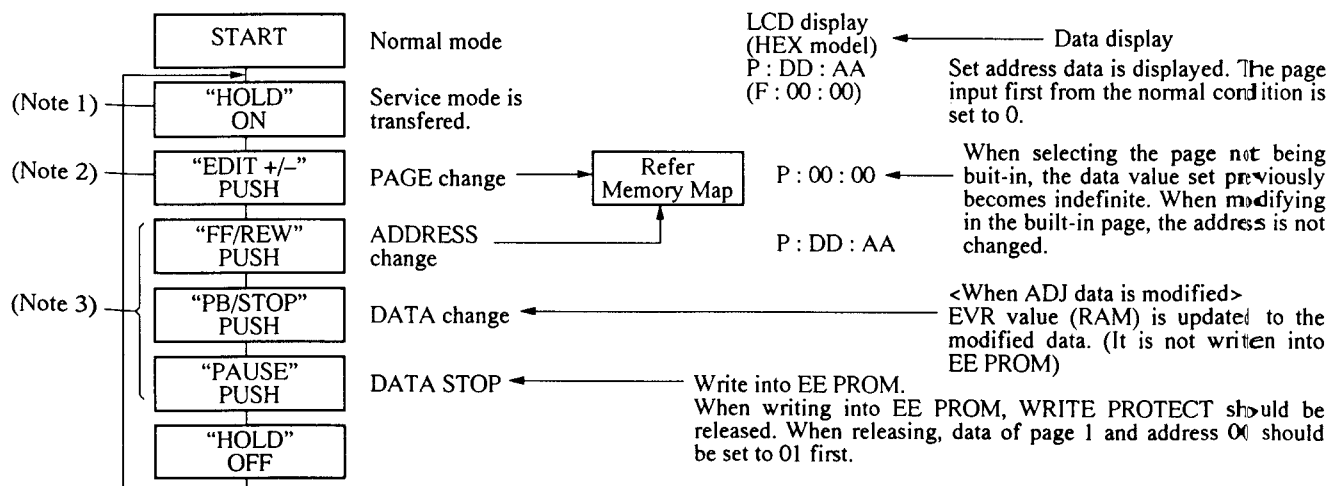
[I/O level and Impedance]

Video output phone jack
Output signal: 1 Vp-p, 75 Ω unbalanced, negative sync

Audio output phone jack
Specified output: -7.5 dBs
Output impedance: More than 2.2 k Ω

10-1-8. Service Mode

[Transfer method of the service mode with the adjustment remote controller]



Command name	Command function	Function Button with the adjustment remote controller
Page Up	Page +1	Edit Search +
Page Down	Page -1	Edit Search -
Direct Page Set	Set to direct page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address -1	Rewind
Data Up	Data +1	Play Back
Data Down	Data -1	Stop
Store	Write data into EEPROM. RAM	Pause

[ADJUST, TEST MODE description]

MODE		PAGE/DATA/ADDRESS	Contents
ADJUST	Switching Position Adjustment	D : -- : 04 (high) D : -- : 05 (low)	Switching position adjustment See to page 289 for details
	Battery Down Adjustment	D : -- : 06 (Sensor value) D : -- : 07 (Set value)	Use for battery down adjustment See to page 288 for details
TEST MODE	Pass Adjustment Truck Shift	1 : 30 : 4D	Truck shift for pass adjustment Set to the data described left and set the playback mode.
	Emergency Inhibit	1 : 10 : 4D	Detection of emergency is inhibited. Even if battery is ended, power is not turned off. SP/LP is not automatically distinguished. Emergency detection except for TAPE/TOP-END is inhibited.
	Emergency Code	D : -- : 20~22 D : -- : 24~26	First emergency is displayed. Last emergency is displayed. (※ See to 1)
	RECOG SW Check	1 : -- : 3D 1 : -- : 3E	Mode switch position is displayed. RECOG SW ON OFF is displayed. (※ See to 2)
	Function SW Check	1 : -- : E8~ED	Pressing KEY is checked. (※ See to 3)
	Motor single check	3 : 10 : DD (Loading Ⓜ) 3 : 11 : DD (Drum Ⓜ) 3 : 12 : DD (Capstan Ⓜ)	Rotating in right direction, inverting, stopping of each motor can be separately controlled. • Loading Motor • Drum Motor (※ See to 4) • Capstan Motor
	Sensor check	3 : 21 : DD	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction DEW sensor. (※ See to 5)
	Reception contents check of wireless remote control	1 : -- : 1E and 1D	The received code contents of the remote control code can be confirmed. (※ See to 6)

※ 1 Emergency Code Check

With the adjustment remote controller

(The emergency code has the first emergency and last emergency. The last emergency side is changed when emergency is generated; the first emergency side records the only code generated first.)

		First	Last	
PAGE	D	ADDRESS	20, 21	24, 25 ← Emergency code
PAGE	D	ADDRESS	22	26 ← Mode when emergency is generated

Displayed ➡ Be sure to rewrite the address from 20 to 26 to data 00 after the operation.

(1) Emergency code list

Code		Emergency contents
20H, 24H	21H, 25H	
00	00	Normal mode
01	00	Loading Motor emergency.
02	00	Unloading, Reel emergency.
04	00	Steady, Reel emergency.
08	00	Capstan emergency.
00	01	Drum steady, FG emergency.
00	02	Drum steady, PG emergency.
00	21	Drum steady, FG emergency.
00	22	Drum steady, PG emergency.
00	41	Loading, Drum FG emergency.
00	42	Loading, Drum PG emergency.
00	81	Unloading, Drum FG emergency.
00	82	Unloading, Drum PG emergency.
—	—	Drum steady Phase emergency.

- In order to delete the contents of [the first and the last emergency], write with adjustment remote controller as follows.

Page 1	Address 00	Data 01
--------	------------	---------

After that, write data 00 into each address.

After writing, return to

Page 1	Address 00	Data 00
--------	------------	---------

(2) Mode code

Mode	Code	Mode	Code
STOP	20	EDIT S CUE	5A
FF	30	EDIT S REV	5B
REW	38	EDIT S STIL	5F
PB	60	+×1	62
CUE	64	-×1	63
REV	65	-STILL	79
STILL	70	+FRAME	76
REC	40	-FRAME	77
REC. P	41	+×2	66
SHUTTLE EDIT (+)	5A	-×2	62
SHUTTLE EDIT (-)	5B	LOADING	21
CAM STBY	41	UNLOADING	13
CAM REC	40	EJECTED	10
REC REV+	58	+SLOW	72
REC REV-	59	-SLOW	73

※ 2 RECOG SW Check

With the adjustment remote controller select page 1 and address 3D or 3E.

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF		V MUTE	A MUTE JOG	VA PB MODE

“1”=REC inhibit

“1”=ME/ 0: MP

“1”=MPHG/ 0: Normal

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3E	DEW			RP PB MODE	CASSETTE COMPARTMENT LOCK	MODE SW2	MODE SW1	MODE SW0

See to the following list

When locking the Cassette Compartment, “1”

• MODE SW CODE LIST

Position	Address 3E contents			Real port condition			Remark
	M SW2	M SW1	M SW0	M SW2	M SW1	M SW0	
EJECT	0	0	0	L	H	H	Cassette Compartment eject position
IA	0	0	1	H	H	H	Interval A
UNLOAD	0	1	0	L	L	H	Normal EJECT unloaded
IB	0	1	1	H	L	H	Interval B
STOP	1	0	0	H	L	L	STOP mode position
IC	1	0	1	H	H	L	Interval C
FWD	1	1	0	L	H	L	Pinch pressure welded
ID	1	1	1	L	L	L	Interval D
SHAKING HEAD POSITION	0	0	0	L	H	L	Shaking head position

☆ This mode releasing is turn off HOLD switch of the adjustment remote controller.

※ **3 Switch check** (See to the previous page for reading code.)

With the adjustment remote controller:

Page 1	Address E8 to ED	Data Refer to table
--------	------------------	---------------------

Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	K IN 7	K IN 6	K IN 5	K IN 4	K IN 3	K IN 2	K IN 1	K IN 0
E8 K OUT0	—	REMOTE ON/OFF	TITLE 2	TITLE 1	—	—	SHUTTER	AUTO LOCK
E9 K OUT1	—	STEREO	MEMORY	COLOR	DATA SCREEN	PUSH AUTO (FOCUS)	FOCUS	PROGRAM AE
EA K OUT2	—	SUB	EDIT (+)	EDIT (-)	FRAME	WHITE BALANCE	BACK LIGHT	—
EB K OUT3	—	STANDBY	PAUSE	RESET	REC	FADER	—	BUZZER
EC K OUT4	—	START/ STOP	PB	ZERO MEMORY	TIME	DATE	AGE	VTR
ED K OUT5	—	EDIT ON/OFF	REW	STOP	EJECT	FF	SLOW	CAM

☆ This mode releasing is turn off HOLD switch of the adjustment remote controller.

- Check the initial set value in shipping after the service, because EE PROM is monuted to VTR in this unit.
D Page Initial set value in shipping (for this unit)

Address	Contents						Set value
00	Aging mode						00
01	Each flag area (destination/model/HEAD width 1×2 MUTE)						F8
02	VTR REC key acceptance authorization						02: AEP, UK model 03: other models
03							--
04	Switching position (low)						Adjustment value
05	Switching position (high)						Adjustment value
06	Battery A/D modification value						Adjustment value
07	Battery end set area						Adjustment value
10	SR data storage area	EDIT OFF	MP	HI8	LP		--
11	SR data storage area	EDIT OFF	MP	HI8	SP		--
12	SR data storage area	EDIT OFF	MP	NOR	LP		16
13	SR data storage area	EDIT OFF	MP	NOR	SP		24
14	SR data storage area	EDIT OFF	ME	HI8	LP		--
15	SR data storage area	EDIT OFF	ME	HI8	SP		--
16	SR data storage area	EDIT OFF	ME	NOR	LP		16
17	SR data storage area	EDIT OFF	ME	NOR	SP		24
18	Titler vertical position adjustment area JOG mode						04
19	Titler vertical position adjustment area NOR mode						06
1A	Titler horizontal position adjustment area playback mode						11
1B	Titler horizontal position adjustment area EE mode						11
1C	When SR data storage area EDIT is ON: Hi8 mode						--
1D	When SR data storage area EDIT is ON: Normal mode						24
1E							--
1F							--
20	First generated emergency code (low) (First emergency)						00
21	First generated emergency code (high) (First emergency)						00
22	Mode code when emergency is generated first						00
23							--
24	Last generated emergency code (low) (Last emergency)						00
25	Last generated emergency code (high) (Last emergency)						00
26	Mode code when emergency is generated last.						00

※ 4 In order to operate the motor singly

[Operation]

Write the following data with the adjustment remote controller into

Page 3	Address DD.
--------	-------------

Then the check of each motor is performed.

10H → Loading motor

11H → Drum motor

12H → Capstan motor

After the set of the above data, operation is performed by pressing the following keys. (When the operation is performed with the adjustment remote controller, set the HOLD switch to left and release the Service mode.)

FF key → Rotating in forward direction

REW key → Rotating in reverse direction

STOP key → Stop

Note) In this mode, operation is only performed on the normally loaded condition.

Note) The motor rotating speed is the normal rotating number. (Drum 25 Hz, Capstan SP mode speed, Loading normal speed.)

In order to release this mode, remove the adjustment remote controller and turn off the power.

※ 5 In order to read the A/D converted value (Sensor check)

[Operation]

With the adjustment remote controller.

Write

PAGE 3	Address DD	Data 21
--------	------------	---------

The following address (PAGE 3) of the A/D converted value of each A/D port is displayed.

Address	Selecting value Contents
65	TOP sensor (light ON)
67	TOP sensor (light OFF)
64	END sensor (light ON)
66	END sensor (light OFF)
62	S-REEL FG
63	T-REEL FG
60	Thermistor (for SWP correction)
5F	DEW sensor

The voltage of A/D converting 1 step: $4.9 \div 256 \approx 19 \text{ mV}$

※ 6 In order to check the reception contents of the wireless remote control

With adjustment remote controller, the received wireless remote control code is displayed to

PAGE 1	Address 1E.
--------	-------------

The wireless remote control code is only displayed while the code which the LANC code is shifted to right for 1 bit is pressed, and FF is displayed when the code is released.

The received category code of the wireless remote control is displayed to the upper 4 bit of

PAGE 1	Address 1D.
--------	-------------

(The description of the wireless remote control code is omitted in this chart.)

10-2. POWER SUPPLY ADJUSTMENT

10-2-1. VIDEO 4.9V Adjustment (SS-136P Board)

Mode	Recording
Signal	Unnecessary
Measurement Point	Pin ⑩ of CN507 (VIDEO 4.9V)
Measuring Instrument	Digital voltmeter
Adjusting Element	RV902
Specified Value	$4.90 \pm 0.05 \text{ Vdc}$

Adjusting method:

1) Adjust to $4.90 \pm 0.05 \text{ Vdc}$ with RV902.

10-2-2. Oscillation Frequency Adjustment (SS-136P Board)

Mode	Recording
Signal	Unnecessary
Measurement Point	Q903 collector
Measuring Instrument	Frequency counter
Adjusting Element	RV901
Specified Value	$475 \pm 5 \text{ kHz}$

Adjusting method:

1) Adjust to $475 \pm 5 \text{ kHz}$ with RV901.

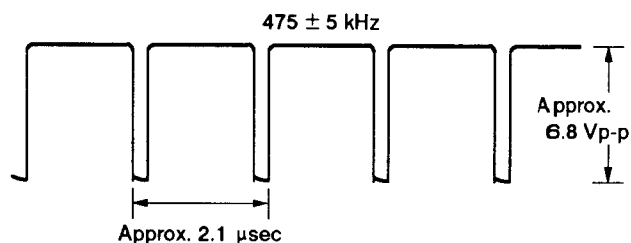


Fig. 10-5.

10-2-3. Power Supply Voltage Check (SS-136P Board)

Measuring Instrument	Digital voltmeter
SS 4.9V check	
Measurement Point	Pin ① of CN506
Specified Value	4.90 ± 0.15 Vdc
AUDIO 4.9V check	
Measurement Point	Pin ⑦ of CN506
Specified Value	4.90 ± 0.15 Vdc
EVF 4.9V check	
Measurement Point	Pin ① of CN503
Specified Value	4.90 ± 0.15 Vdc
LM 5V check	
Measurement Point	Pin ⑮ of CN502
Specified Value	4.85 ± 0.15 Vdc

Checking method:

- 1) Each power supply voltage should satisfy the specified values at normal temperature and humidity.

10-3. SYSTEM CONTROL SYSTEM ADJUSTMENT

10-3-1. Battery Down Adjustment

Mode	CAMERA REC
Signal	Unnecessary
Adjustment Page	D
Adjustment Address	06

Connection:

- 1) Make this adjustment with MIC board, EVF board, and CAMERA block connected.
- 2) Connect the adjustment remote controller to the REMOTE terminal.
- 3) Connect the digital voltmeter so to measure the voltage of the regulated power supply unit connected to the battery terminal.

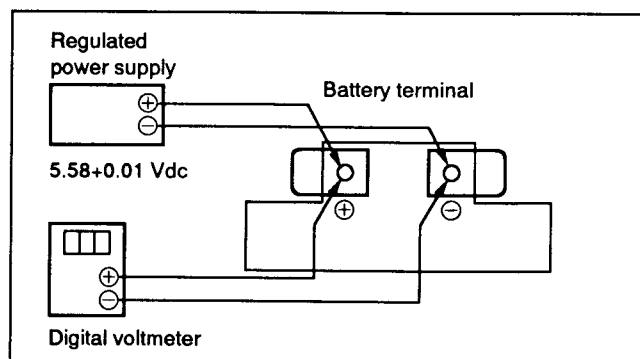


Fig. 10-6.

Adjusting method:

- 1) Set the POWER switch to CAMERA position.
- 2) Adjust the output voltage of the regulated power supply unit to be 6.3 ± 0.1 Vdc.
- 3) Set up the CAMERA REC mode.
- 4) Set the HOLD switch of the adjustment remote controller to the HOLD side.
- 5) Adjust the output voltage of the regulated power supply unit to be 5.58 ± 0.01 Vdc (battery terminal voltage).
- 6) Press once the EDIT SEARCH (+) button of the adjustment remote controller to select page 1.
- 7) Select address 00 with the adjustment remote controller and set the data to 01. (Release the protector.)
- 8) Press four times the EDIT SEARCH (–) button of the adjustment remote controller. (Set the adjustment page to D.)
- 9) Select address 06 and press the PAUSE button of the adjustment remote controller (Store the reference value in the memory.)

Reference value

d: 7d:06

Page Data Address

- 10) Turn off the POWER switch.

Checking method:

Remove the adjustment remote controller and check the following points. If the required conditions are not obtained, repeat the adjustments again.

- 1) Adjust the output voltage of the regulated power supply so that the digital voltmeter reading becomes 6.30 ± 0.01 Vdc. (VTR in camera recording mode)
- 2) Confirm that the  mark is not lit on the EVF (viewfinder) screen (TALLY lamp is lit).
- 3) Lower the output voltage of the regulated power supply so that the digital voltmeter reading becomes 5.66 ± 0.01 Vdc.
- 4) Confirm that the  mark and the TALLY lamp are flashing in approx. 1 sec intervals on the EVF screen. ( mark should not be blinking.)
- 5) Lower the output voltage of the regulated power supply so that the digital voltmeter reading becomes 5.58 ± 0.01 Vdc.
- 6) Confirm that the flashing interval of the  mark and the TALLY lamp on the EVF screen becomes shorter, and that the VTR stops and the power is turned off.

10-3-2. Clock Accuracy Adjustment (FU-104 Board)

Mode	E-E
Signal	Unnecessary
Measurement Point	Pin ⑥ of IC501
Measuring Instrument	Frequency counter
Adjusting Element	CT501
Specified Value	512.000 ± 0.001 Hz

Note: Use a 10 : 1 probe for connecting the frequency counter.

Adjusting method:

- 1) Adjust to 512.000 ± 0.001 Hz with CT501.

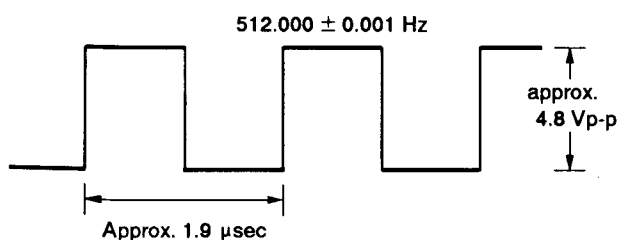


Fig. 10-7.

10-4. SERVO SYSTEM ADJUSTMENT

10-4-1. Switching Position Adjustment (SS-136P Board)

Mode	Playback
Signal	Alignment tape : Operation check (WR5-1CP)
Measurement Point	CH1: CN508 pin ④ (D SWP) CH2: CN508 pin ③ (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	05 04
Specified Value	$t=0 \pm 10 \mu\text{sec}$

Adjusting method:

- 1) Set the HOLD switch of the adjustment remote controller to the HOLD side. (ADJUST MODE is set.)
- 2) Select page 1 and address 00 with the adjustment remote controller and set the data to 01. (Protector is released.)



- 3) Press four times the EDIT SEARCH (←) button of the adjustment remote controller. (Adjustment page D is set.)
- 4) Change the data at address 05 (for coarse adjustment) and minimize "t".
- 5) Press the PAUSE button of the adjustment remote controller to store the data in the memory.
- 6) Change the data at address 04 (for fine adjustment) and adjust to $t=0 \pm 10 \mu\text{sec}$.
- 7) Press the PAUSE button of the adjustment remote controller
- 8) Turn off the POWER switch.

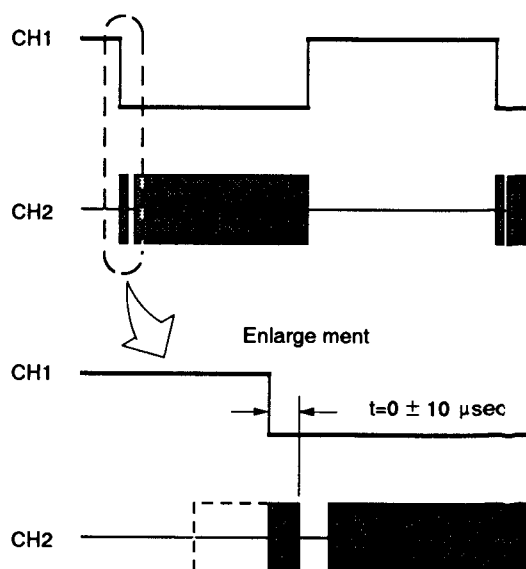


Fig. 10-8.

10-5. VIDEO BLOCK ADJUSTMENTS

The adjustment of the video system should in principle follow the adjustment procedure outlined below.

The color video signal supplied from the pattern generator is utilized as the video input signal for the video system adjustment in the recording mode. Make sure that the sync signal and the color burst signal match the specifications given in Set-up for adjustment, as shown in Fig. 10-3.

[Adjustment procedure]

- 1) Playback frequency characteristics adjustment
- 2) Crystal oscillator f_0 adjustment
- 3) REC EE level adjustment
- 4) IR adjustment
- 5) Chroma comb filter adjustment
- 6) Emphasis Y level adjustment
- 7) PB CCD input level adjustment
- 8) PB Y level adjustment
- 9) Y FM carrier frequency adjustment
- 10) Y FM deviation adjustment
- 11) Chroma emphasis f_0 adjustment
- 12) REC C RF level adjustment
- 13) REC Y level adjustment
- 14) REC ATF level checking

10-5-1. Playback Frequency Characteristics Adjustment (RP-77 Board)

1. CH1, CH2 adjustment

Note: The adjusting element for CH2 is shown in parentheses [].

Mode	Playback
Signal	Alignment tape: For frequency characteristics adjustment (WR5-6C)
Measurement Point	CH1: Pin ③ [Pin ③] of CN508 on SS-136P board EXT TRIG: Pin ④ of CN508 on SS-136P board
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [-]
Adjusting Element	RV102 [RV101]
Specified Value	3.58 MHz level : 5.5 MHz level =4 : (3 ± 0.3)

Adjusting method:

- 1) Adjust RV102 [RV101] so that the ratio of the 3.58 MHz level to the 5.5 MHz level of the PB RF output waveform becomes 4: (3 ± 0.3).

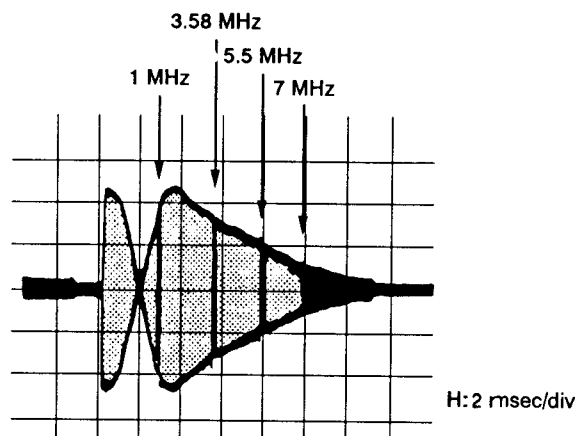


Fig. 10-9.

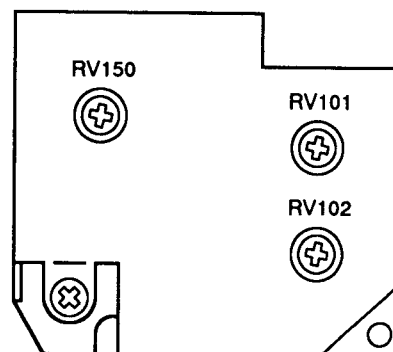


Fig. 10-10.

2. CH1' adjustment

Mode	Playback (CH1' playback mode)
Signal	Alignment tape: For frequency characteristics adjustment (WR5-6C)
Measurement Point	CH1: Pin ③ of CN508 on SS-136P board EXT TRIG: Pin ④ of CN508 on SS-136P board
Measuring Instrument	Oscilloscope TRIG SLOPE: -
Adjusting Element	RV150
Specified Value	3.58 MHz level : 5.5 MHz level =4 : (3 ± 0.3)

Adjusting method:

- 1) Connect the adjustment remote controller to REMOTE terminal (J901 on SW-175P board).
- 2) Set the HOLD switch of the adjustment remote controller to the on position.
- 3) Select the page 1 and the address 4D with the adjustment remote controller, and set the data to 20.
(CH1' playback mode setting)
- 4) Adjust RV150 so that the ratio of the 3.58 MHz level to the 5.5 MHz level of the PB RF output waveform becomes 4: (3 ± 0.3)
- 5) Remove the adjustment remote controller.

10-5-3. REC EE LEVEL Adjustment (VA-70 Board)

Mode	E-E
Signal	Color bar
Measurement Point	VIDEO OUT terminal (J201)
Measuring Instrument	Oscilloscope
Adjusting Element	RV205
Specified Value	1.00 ± 0.025 Vp-p

Note: Terminate VIDEO OUT terminal (J201) at 75Ω .

Adjusting method:

- 1) Adjust RV205 for 1.00 ± 0.025 Vp-p.

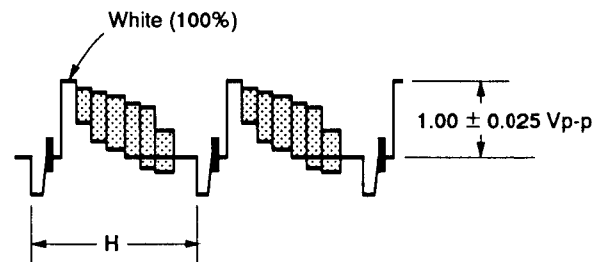


Fig. 10-12.

10-5-2. Crystal Oscillator fo Checking (VA-70 Board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑫ of IC203
Measuring Instrument	Frequency counter
Specified Value	4433619 ± 70 Hz

Checking method:

- 1) Confirm that the oscillation frequency at Pin ⑫ of IC203 is 4433619 ± 70 Hz.

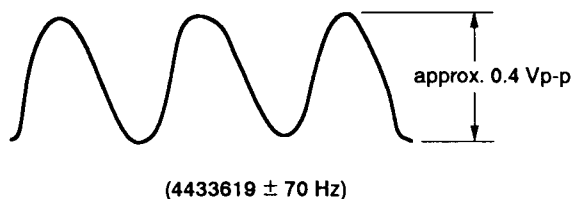


Fig. 10-11. Crystal oscillator fo adjustment

10-5-4. IR Adjustment (VA-70 Board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of IC201
Measuring Instrument	Oscilloscope
Adjusting Element	RV201
Specified Value	Minimum red residual chroma component (80 mVp-p or less)

Connections:

- 1) Connect TP003 (Pin ⑭ of IC201) and TP007 (Pin ⑤① of IC201) with a jumper wire.

Adjusting Method:

- 1) Minimize the red residual chroma component with RV201.
- 2) After the adjustment, remove the jumper wire.

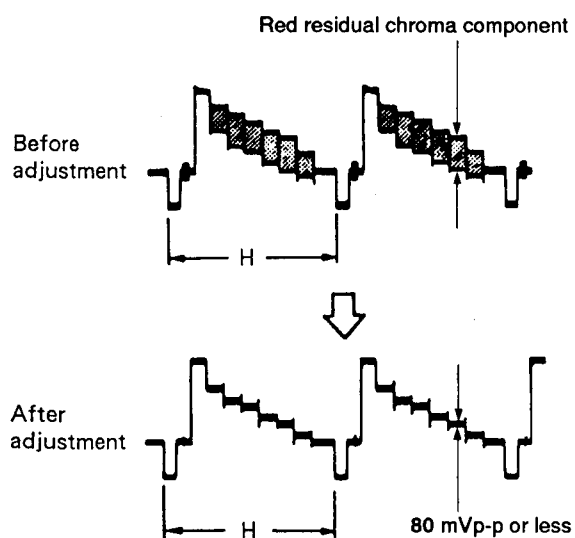


Fig. 10-13.

10-5-5. Chroma Comb Filter Adjustment (VA-70 Board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑪ of IC201
Measuring Instrument	Oscilloscope
Adjusting Element	RV204 RV211
Specified Value	Minimum red residual chroma component

Adjusting method:

- 1) Adjust RV204 and RV211 alternately and minimize the red residual chroma component.

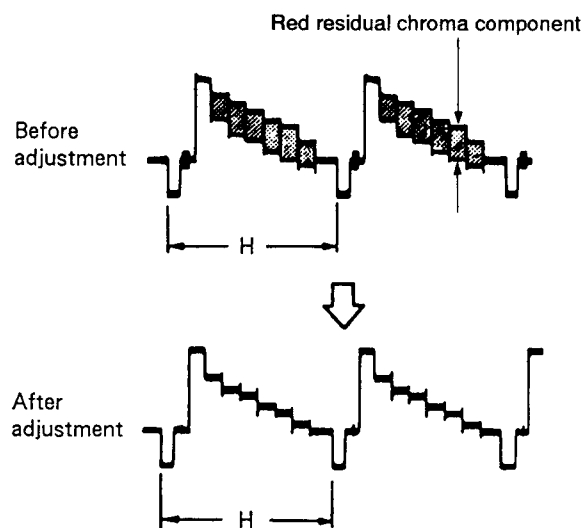


Fig. 10-14.

10-5-6. Emphasis Y Level Adjustment (VA-70 Board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ③ of IC201
Measuring Instrument	Oscilloscope
Adjusting Element	RV202
Specified Value	$0.50 \pm 0.025 \text{ Vp-p}$

Adjusting method:

- 1) Adjust RV202 for $0.50 \pm 0.025 \text{ Vp-p}$.

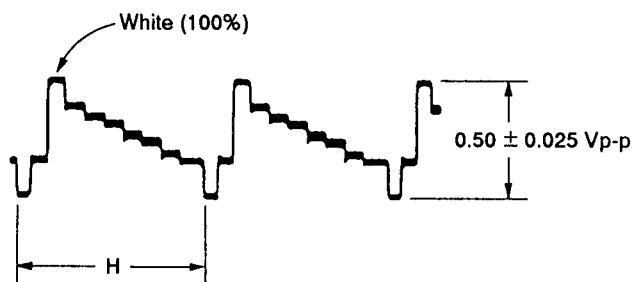


Fig. 10-15.

10-5-7. PB CCD Input Level Adjustment (VA-70 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP) color bar section
Measurement Point	Pin ② of IC201
Measuring Instrument	Oscilloscope
Adjusting Element	RV210
Specified Value	$0.50 \pm 0.025 \text{ Vp-p}$

Adjusting method:

- 1) Adjust RV210 for $0.50 \pm 0.025 \text{ Vp-p}$.
- 2) Be sure to perform "PB Y level adjustment" after this adjustment.

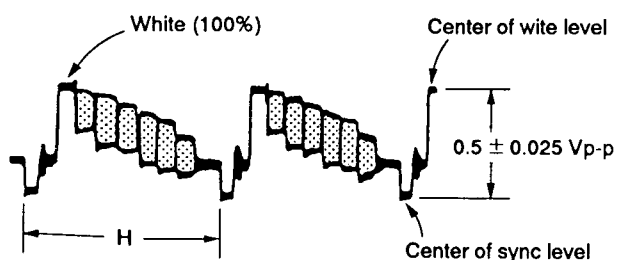


Fig. 10-16.

10-5-8. PB Y Level Adjustment (VA-70 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP) Color bar section
Measurement Point	VIDEO OUT terminal (J201)
Measuring Instrument	Oscilloscope
Adjusting Element	RV203
Specified Value	$1.00 \pm 0.05 \text{ Vp-p}$

Note: 1) Terminate VIDEO OUT terminal (J201) at 75Ω .

- 2) Make sure that "PB CCD Input Level Adjustment" has been completed.

Adjusting method:

- 1) Adjust RV203 for $1.00 \pm 0.05 \text{ Vp-p}$.

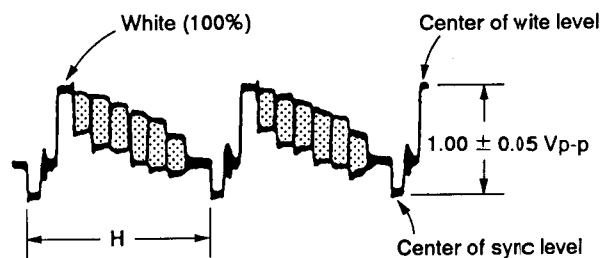


Fig. 10-17.

10-5-9. Y FM Carrier Frequency Adjustment (VA-70 Board)

Mode	E-E
Signal	No signal
Measurement Point	R158 side terminal of RV101
Measuring Instrument	Frequency counter
Adjusting Element	RV207
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

- 1) Adjust RV207 for 4.38 ± 0.04 MHz.
- 2) Perform "Y FM Deviation Adjustment".
- 3) Make this adjustment again after completing "Y FM Deviation Adjustment".

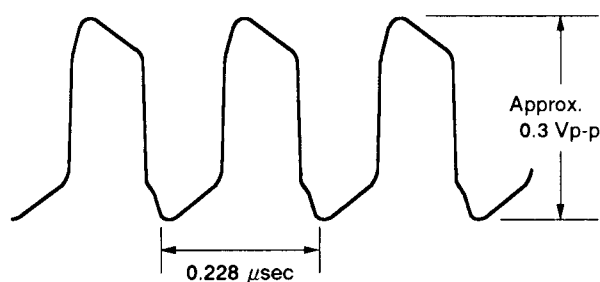


Fig. 10-18.

10-5-10. Y FM Deviation Adjustment (VA-70 Board)

Mode	Recording and playback
Signal	Color bar
Measurement Point	VIDEO OUT terminal (J201)
Measuring Instrument	Oscilloscope
Adjusting Element	RV206
Specified Value	Playback level is 1.00 ± 0.05 Vp-p

Note: 1) Confirm that "Emphasis Y Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

- 2) Terminate VIDEO OUT terminal (J201) at 75Ω .

Adjusting method:

- 1) Record the color bar signal.
- 2) Playback the recorded signal.
- 3) Confirm the playback output.
Specified value: 1.00 ± 0.05 Vp-p
- 4) If not meet the specified value, repeat 1) to 3) after turning RV206 in the following manner.

	Rotation direction of RV206
When larger than specified value	Clockwise (○)
When smaller than specified value	Counterclockwise (○)

Table 10-2.

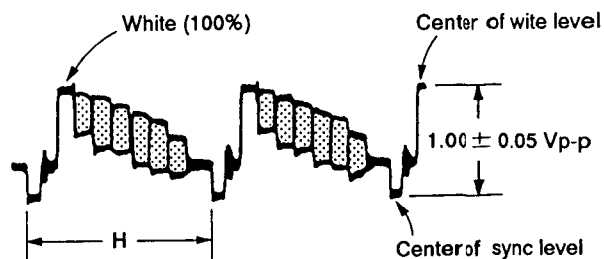


Fig. 10-19. Y FM deviation adjustment

10-5-11. Chroma Emphasis fo Adjustment (VA-70 Board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ②④ of IC203
Measuring Instrument	Oscilloscope
Adjusting Element	FL302
Specified Value	Minimum fo component

Adjusting method:

- 1) Adjust FL302 so that the amplitude of flat red portion of the chroma signal becomes minimum.

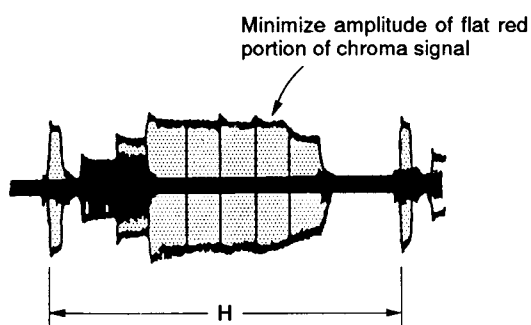


Fig. 10-20.

10-5-12. REC C RF Level Adjustment (VA-70 Board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ① of CN507
Measuring Instrument	Oscilloscope
Adjusting Element	RV301
Specified Value	110 ± 10 mVp-p

Adjusting method:

- 1) Adjust RV301 so that the amplitude of flat red portion of the chroma signal becomes 110 ± 10 mVp-p.

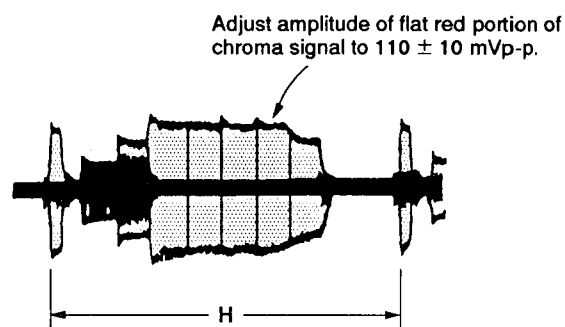


Fig. 10-21.

10-5-13. REC Y Level Adjustment (VA-70 Board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑤ of CN507
Measuring Instrument	Oscilloscope 20 MHz BAND WIDTH LIMITER: ON
Adjusting Element	RV101
Specified Value	230 ± 10 mVp-p

Note: Be sure to use MP type tape.
(Pin ⑩ of CN507 should be "L".)

Adjusting method:

- 1) Adjust RV101 for 230 ± 10 mVp-p.

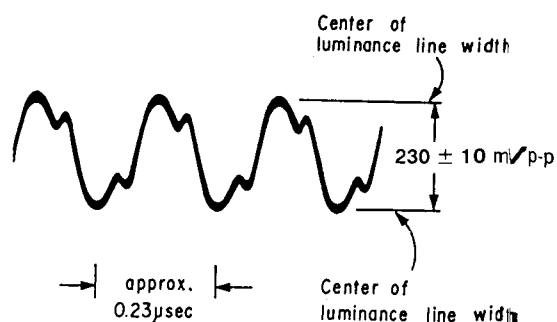


Fig. 10-22.

10-5-14. REC ATF Level Checking (SS-136P Board)

Mode	Recording
Signal	No signal
Measurement Point	Pin ⑫ of CN501
Measuring Instrument	Oscilloscope
Specified Value	$710 \pm 90 \text{ mVp-p}$

Checking method:

- 1) Confirm that the REC ATF signal level is $710 \pm 90 \text{ mVp-p}$.

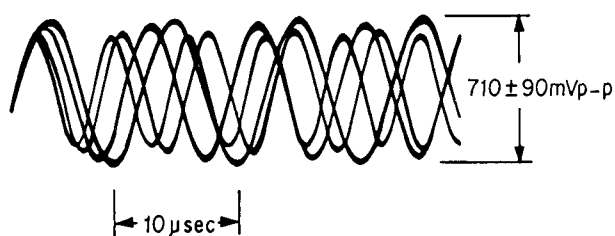


Fig. 10-23.

10-5-15. Quasi Burst Phase Adjustment (VA-70 Board) (Method using vectorscope)

Mode	Playback and playback pause
Signal	Alignment tape for operation check (WR5-5CSP) Color bar section
Measurement Point	VIDEO OUT terminal (J201)
Measuring Instrument	Vectorscope
Adjusting Element	RV353
Specified Value	$\pm 45^\circ$

Connection:

- 1) Input 4.43 MHz signal from pin ⑫ of IC203 to CH1 input of the oscilloscope.
- 2) Connect CH1 output of the oscilloscope to the EXT. subcarrier reference input of the vectorscope.
- 3) Turn on the EXT. subcarrier switch of the vectorscope.

Adjusting method:

- 1) Playback the color bar section.
- 2) Adjust the burst phase to $\pm 45^\circ$ with PHASE knob of the vectorscope.
- 3) Set up playback pause mode.
- 4) Adjust the burst phase to $\pm 45^\circ$ with RV353.

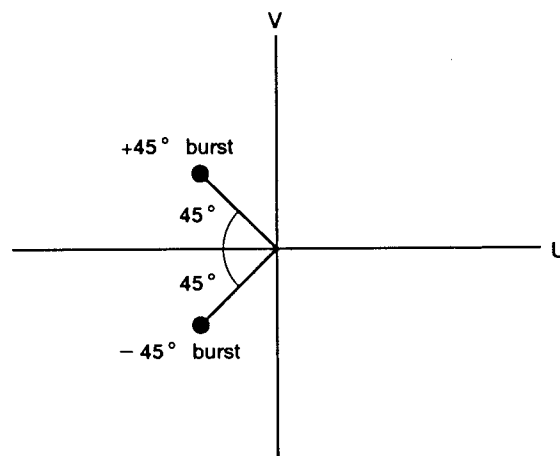


Fig. 10-24.

**10-5-16. Delay Burst Phase Adjustment (VA-70 Board)
(Method using vectorscope)**

Mode	Playback pause
Signal	Alignment tape: For operation check (WR5-5CSP) Color bar section
Measurement Point	VIDEO OUT terminal (J201)
Measuring Instrument	Vectorscope
Adjusting Element	RV351
Specified Value	Minimum shaking of yellow and blue luminance points

Adjusting method:

- 1) Minimize the shaking of yellow and blue luminance points with RV351.

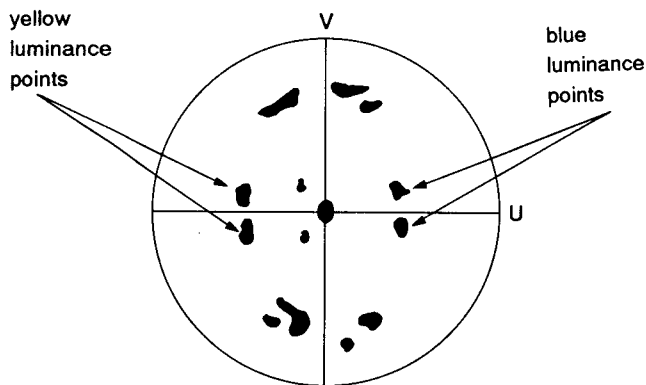


Fig. 10-25.

**10-5-17. Quasi Burst Phase Adjustment (VA-70 Board)
(Method using monitor TV)**

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Color bar section
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV353
Specified Value	Minimum chroma flickering

Connection:

- 1) Connect Pin ② of IC204 and collector of Q353 using a diode (1SS119, etc.).

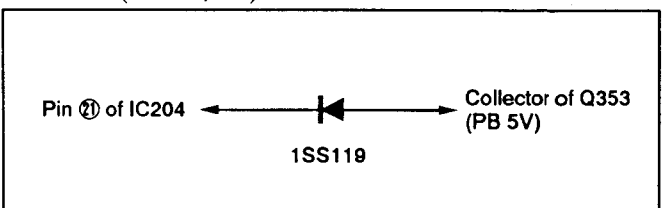


Fig. 10-26.

Adjusting method:

- 1) Observe the monitor screen. If color is abnormal, stop the unit and then set the playback mode again.
- 2) Set the monitor color level to maximum and its bright level to minimum.
- 3) Rotate RV353 fully in the clockwise direction (↻).
- 4) Turn RV353 slowly counterclockwise and stop where chroma flicker is minimum and horizontal black stripes are least visible.
- 5) Remove the diode.

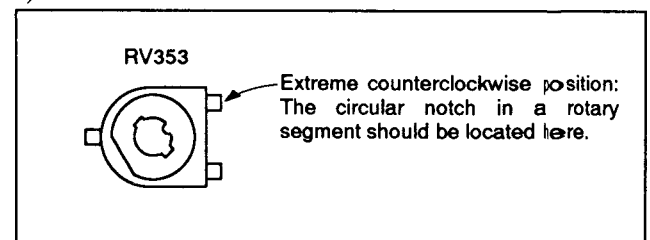


Fig. 10-27.

10-5-18. Delay Burst Phase Adjustment (VA-70 Board) (Method using monitor TV)

Mode	Playback pause
Signal	Alignment tape for operation check (WR5-5CSP) Color bar section
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjustment Element	RV351
Specified Value	Minimum chroma flickering

Adjust method:

- 1) Set the monitor TV color level to maximum and its bright level to minimum.
- 2) Minimize chroma flicker with RV351 so that horizontal black stripes cannot longer be seen.

10-6. CHARACTER GENERATOR ADJUSTMENTS

Connect 20-pin extension cord between CN705 on the CT-40 board and CN703 on the VA-70 board.

10-6-1. Character Generator SG Frequency Adjustment (CT-40 Board)

Mode	E-E
Signal	Non-signal
Measurement Point	Pin ①9 of IC902
Measuring Instrument	Frequency counter
Adjustment Element	CT902
Specified Value	15625 ± 100 Hz

Adjusting method:

- 1) Adjust to 15625 ± 100 Hz with CT902.

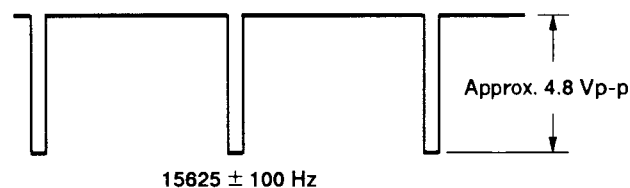


Fig. 10-28.

10-6-2. DDS Character Position Adjustment (CT-40 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP) Color bar section
Measurement Point	Confirmed on monitor TV
Measuring Instrument	
Adjustment Element	CT901

Adjusting method:

- 1) Press DATA SCREEN button and confirm that the tape counter is displayed on the monitor TV screen.
- 2) Adjust CT901 until the right inner contour of the number at right side of the tape counter indication is line up with the border line between the blue and black color bars.

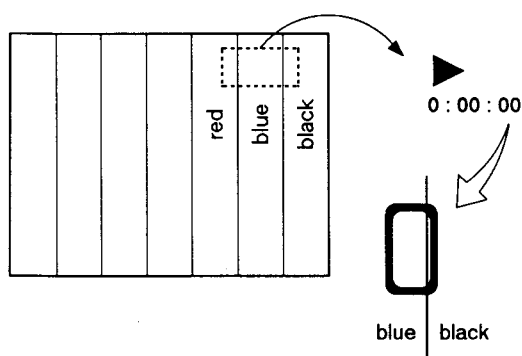


Fig. 10-29.

10-7. AUDIO SYSTEM ADJUSTMENTS

- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instruments]

In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the Fig. 10-30, and set the power switch to VTR (PLAYER) position for adjustment.

Unless otherwise specified, set the bilingual switch (S500 on the VA-70 board) to the following position.

- Green (stereo) position

Note: 1) Unless otherwise specified, input the same signal to both channel of L and R when input a audio signal.

- 2) Be sure to insert plug (shorting plug or dummy plug, etc.) into AUDIO OUT R terminal. If not, the mode will be monaural and an appropriate adjustment can not be performed.

(Monaural mode)

When recording.....REC AFM RF 1.7 MHz carrier is not output.
REC matrix is off.

- 3) In adjustments which is performed for both R and L channels, the adjusting element for R channel is shown in brackets [].
- 4) When performing the adjustment in the CAMERA mode (the camera block should be connected), disconnect CN401 on VA-70 board and input the audio signal to Pins ② (MIC IN L) and ④ (MIC IN R) of CN401. The reference input level is -34.5 dBs. And a resistor of about 1 kΩ is required to connect Pins ⑤ (MIC ST/MONO) and ① (AUDIO 4.9V) of CN401.

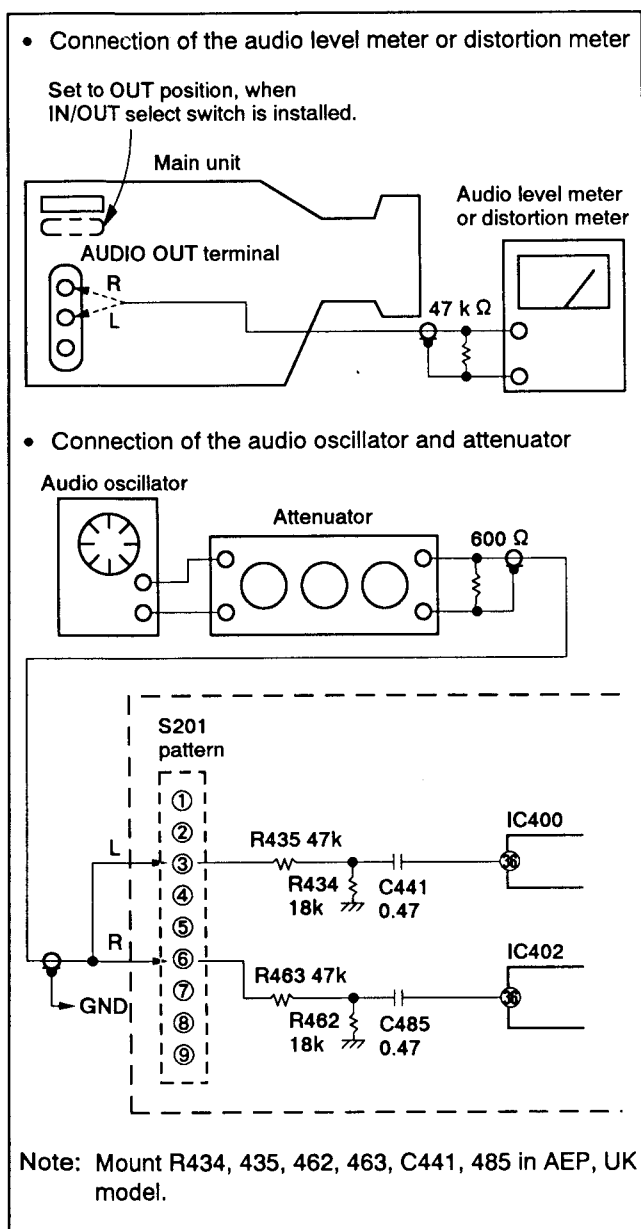


Fig. 10-30.

[Adjustment procedure]

- 1) IR adjustment
- 2) 1.5 MHz carrier frequency check
- 3) 1.7 MHz carrier frequency check
- 4) 1.5 MHz recording level adjustment
- 5) 1.7 MHz recording level adjustment
- 6) E-E output level check
- 7) REC matrix L-R adjustment
- 8) REC matrix L+R check
- 9) 1.5 MHz deviation adjustment
- 10) 1.7 MHz deviation adjustment
- 11) PB matrix adjustment
- 12) Overall level characteristics, separation check
- 13) Overall distortion check
- 14) Overall noise level check

10-7-1. IR Adjustment (VA-70 Board)

Mode	Playback
Signal	Alignment tape: for AFM stereo operation check (WR5-9CS) Bilingual (monoscope) section
Measurement Point	1. Pin ⑥ and ④④ of IC400 2. Pin ⑥ and ④④ of IC402
Measuring Instrument	Digital voltmeter
Adjustment Element	1. RV400 (1.5IR) 2. RV404 (1.7IR)
Specified Value	0 ± 10 mVdc

Adjusting method:

- 1.5 IR adjustment
 - 1) Connect the digital voltmeter to Pin ④④ of IC400 and read the DC voltage level. (Approx. 2100 mVdc)
 - 2) Connect the digital voltmeter to Pin ⑥ of IC400.
 - 3) Adjust RV400 so that the voltage level at Pin ⑥ of IC400 becomes the same as Pin ④④ of IC400. (Tolerance level= ± 10 mVdc)
- 1.7 IR adjustment
 - 4) Connect the digital voltmeter to Pin ④④ of IC404 and read the DC voltage level. (Approx. 2100 mVdc)
 - 5) Connect the digital voltmeter to Pin ⑥ of IC404.
 - 6) Adjust RV404 so that the voltage level at Pin ⑥ of IC404 becomes the same as Pin ④④ of IC404. (Tolerance level= ± 10 mVdc)

10-7-2. 1.5 MHz Carrier Frequency Check (VA-70 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑧ of IC400
Measuring Instrument	Frequency counter
Specified Value	1.500 ± 0.002 MHz

Note: Use a 10:1 probe for connecting the frequency counter.

Checking method:

- 1) Confirm that the carrier frequency is 1.500 ± 0.002 MHz.

10-7-3. 1.7 MHz Carrier Frequency Check (VA-70 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑧ of IC402
Measuring Instrument	Frequency counter
Specified Value	1.700 ± 0.002 MHz

Note: Use a 10:1 probe for connecting the frequency counter.

Checking method:

- 1) Confirm that the carrier frequency is 1.700 ± 0.002 MHz.

10-7-4. 1.5 MHz Recording Level Adjustment (VA-70 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ② of CN507
Measuring Instrument	Oscilloscope
Adjustment Element	RV406
Specified Value	90 ± 10 mVp-p

Connections:

- 1) Connect Collector of Q413 and GND with a jumper wire.

Checking method:

- 1) Adjust RV406 so that the 1.5 MHz REC AFM RF signal level becomes 90 ± 10 mVp-p.
(Read the center level of the luminance line width.)

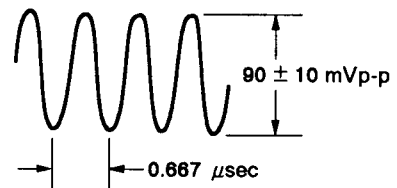


Fig. 10-31.

10-7-5. 1.7 MHz Recording Level Adjustment (VA-70 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ② of CN507
Measuring Instrument	Oscilloscope
Adjustment Element	RV407
Specified Value	72 ± 10 mVp-p

Connections:

- 1) Connect Pin ⑧ of IC400 and GND with $0.01 \mu\text{F}$ capacitor.

Checking method:

- 1) Confirm that the shorting plug is inserted into AUDIO OUT R (red) terminal.
- 2) Adjust RV407 so that the 1.7 MHz REC AFM RF signal level becomes 72 ± 10 mVp-p. (Read the center level of the luminance line width.)

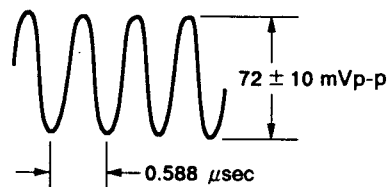


Fig. 10-32.

10-7-6. E-E Output Level Check (VA-70 Board)

Mode	Recording
Signal	400 Hz, -7.5dBs : Pin ③ and Pin ⑥ of S201 pattern (AUDIO IN L and R)
Measurement Point	AUDIO OUT L [R] terminal
Measuring Instrument	Audio level meter
Specified Value	-7.5 ± 2 dBs

Note: Insert a plug to AUDIO OUT R terminal

Checking method:

- 1) Confirm that the 400 Hz signal level is -7.5 dBs.

10-7-7. REC Matrix L-R Adjustment (VA-70 Board)

Mode	Recording
Signal	400 Hz, -7.5dBs : Pin ③ and Pin ⑥ of S201 pattern (AUDIO IN L and R)
Measurement Point	Pin ⑤ of IC401
Measuring Instrument	Oscilloscope
Adjusting Element	RV402
Specified Value	0 ± 5 mVp-p

Note: 1) Use a 1:1 probe.

- 2) Insert any plug to AUDIO OUT R terminal.

Checking method:

- 1) Adjust RV402 so that the 400 Hz signal level is 0 ± 5 mVp-p.

10-7-8. REC Matrix L+R Check (VA-70 Board)

Mode	Recording
Signal	1. 400 Hz, -7.5 dBs: Pin ③ of S201 pattern (AUDIO IN L) 2. 400 Hz, -7.5 dBs: Pin ⑥ of S201 pattern (AUDIO IN R)
Measurement Point	Pin ⑤ of IC401
Measuring Instrument	Oscilloscope
Specified Value	The level difference between L input and R input is 0 ± 10 mVp-p.

Note: 1) When measuring signal level at Pin ⑤ of IC401, start measuring 1 minute after the signal input. (To stabilize AGC)

- 2) Insert any plug to AUDIO OUT R terminal.

Checking method:

- 1) Input 400 Hz, -7.5 dBs signal only to Pin ③ of S201 pattern.
- 2) Read the signal level at Pin ⑤ of IC401 and make a note of it. (Approx. 200 mVp-p)
- 3) Input 400 Hz, -7.5 dBs signal only to Pin ⑥ of S201 pattern.
- 4) Confirm that the level at Pin ⑤ of IC401 is [the level measured in step 2) ± 10 mVp-p.

10-7-9. 1.5 MHz Deviation Adjustment (VA-70 Board)

Mode	Playback
Signal	Alignment tape: for operation check (WR5-5CSP)
Measurement Point	AUDIO OUT terminal
Measuring Instrument	Oscilloscope
Adjusting Element	RV401 (1.5 DEV)
Specified Value	-7.5 ± 0.5 dBs

Switch setting:

- Bilingual switch (S400 on the VA-70 board).....Main

Adjusting method:

- 1) Adjust RV401 so that the 400 Hz signal level becomes -7.5 dBs.

10-7-10. 1.7 MHz Deviation Adjustment (VA-70 Board)

Mode	Playback
Signal	Alignment tape: for AFM stereo operation check (WR5-9CS) Bilingual (monoscope) section
Measurement Point	1. Pin ② of IC401 2. Pin ① of IC401
Measuring Instrument	Oscilloscope
Adjusting Element	RV405 (1.7 DEV)
Specified Value	400 Hz level: 1 kHz level= 8 : (7.5 ± 0.05)

Adjusting method:

- 1) Connect the probe of oscilloscope to Pin ② of IC401.
- 2) Adjust VOLT/DIV knob of the oscilloscope so that the signal level of 400 Hz becomes 8 division.
- 3) Disconnect the probe and connect to Pin ① of IC401.
- 4) Adjust RV405 so that the signal level of 1 kHz becomes 7.5 division.

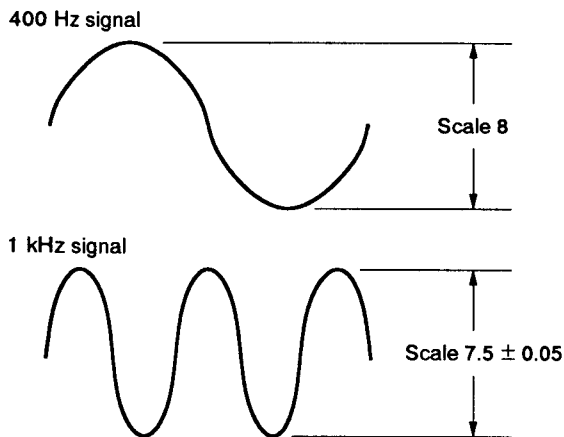


Fig. 10-33.

10-7-11. PB Matrix Adjustment (VA-70 Board)

1. PB Matrix L Adjustment

Mode	Self-recording/playback
Signal	Non signal: Pin ③ of S201 pattern (AUDIO IN L) 400 Hz, -7.5 dBs: Pin ⑥ of S201 pattern (AUDIO IN R)
Measurement Point	AUDIO OUT L terminal
Measuring Instrument	Oscilloscope
Adjusting Element	RV403
Specified Value	400 Hz crosstalk signal level is 0 ± 10 mVp-p

Note: Insert any plug to AUDIO OUT R terminal.

Adjusting method:

- 1) Input 400 Hz, -7.5 dBs audio signal only to Pin ⑥ of S201 pattern.
- 2) Record it.
- 3) Playback the recorded section.
- 4) Adjust with RV403 so that the 400 Hz crosstalk signal level becomes minimum.

2. PB Matrix R Check

Mode	Self-recording/playback
Signal	400 Hz, -7.5 dBs: Pin ③ of S201 (AUDIO IN L) Non signal: Pin ⑥ of S201 (AUDIO IN R)
Measurement Point	AUDIO OUT R terminal
Measuring Instrument	Oscilloscope
Specified Value	400 Hz crosstalk signal level is 0 ± 20 mVp-p

Note: Insert any plug to AUDIO OUT R terminal.

Checking method:

- 1) Input 400 Hz, -7.5 dBs audio signal only to Pin ③ of S201 pattern.
- 2) Record it.
- 3) Playback the recorded section.
- 4) Confirm that the 400 Hz crosstalk signal level is 0 ± 20 mVp-p.

10-7-12. Overall Level Characteristics, Separation Check (VA-70 Board)

Mode	Self-recording and playback
Signal	400 Hz, -7.5 dBs: Pin ③ [Pin ⑥] of S201 pattern Non-signal : Pin ⑥ [Pin ③] of S201 pattern
Measurement Point	AUDIO OUT R and L terminals
Measuring Instrument	Audio level meter
Specified Value	Signal level: -7.5 ± 2 dBs Crosstalk level: -27.5 dBs or less

Note: 1) Be sure to insert any plug into AUDIO OUT R terminal when recording.
2) Confirm that the bilingual switch (S400 on the VA-70 board) is set on the green (stereo) position.

Checking method:

- 1) Record the signal.
- 2) Play back the recorded portion.
- 3) Confirm that the output level of AUDIO OUT L[R] terminal is -7.5 ± 2 dBs.
- 4) Confirm that the output level of AUDIO OUT R[L] terminal is -27.5 dBs or less.

10-7-13. Overall Distortion Check (VA-70 Board)

Mode	Self-recording and playback
Signal	400 Hz, -7.5 dBs Pin ③ and ⑥ of S201 pattern
Measurement Point	AUDIO OUT L [R] terminal
Measuring Instrument	Distortion meter
Specified Value	0.8% or less *1

Checking method:

- 1) Record the signal.
 - 2) Play back the recorded portion.
 - 3) Confirm that the distortion is less than 0.8%. *1
- *1: Value when a distortion measuring filter (Fig. 10-34.) is used. Less than 1.0% when no filter is used.

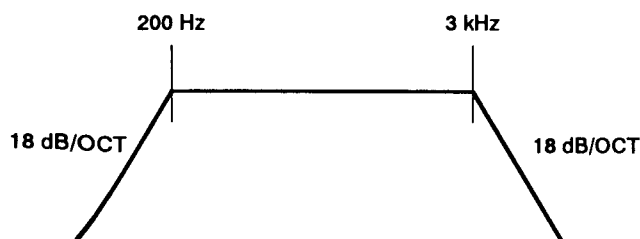


Fig. 10-34.

10-7-14. Overall Noise Level Check (VA-70 Board)

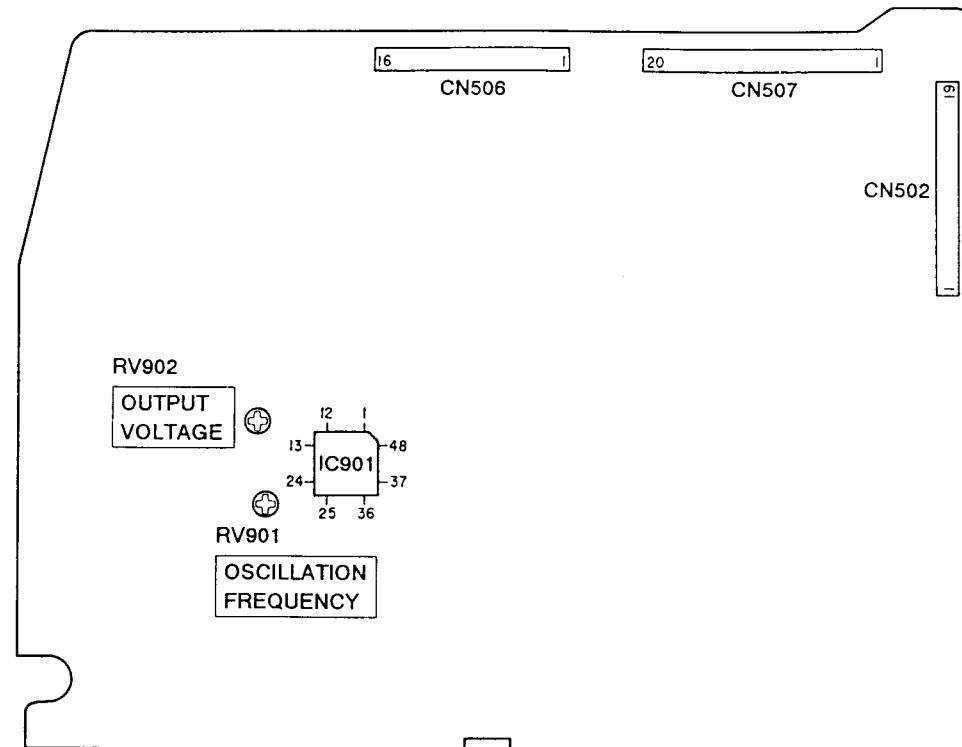
Mode	Self-recording and playback
Signal	Non-signal: Pin ③ and ⑥ of S201 pattern
Measurement Point	AUDIO OUT L [R] terminal
Measuring Instrument	Audio level meter
Specified Value	Less than -61 dBs

Checking method:

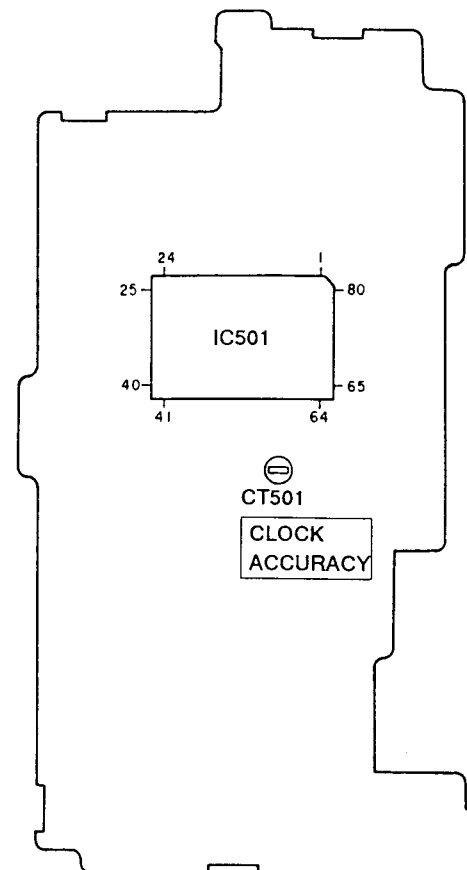
- 1) Record the signal
 - 2) Play back the recorded portion.
 - 3) Confirm that the noise level is less than -61 dBs. *1
- *1: Value when the A curve auditory correction filter is used.

10-8. ARRANGEMENT DIAGRAMS FOR ADJUSTMENT PARTS

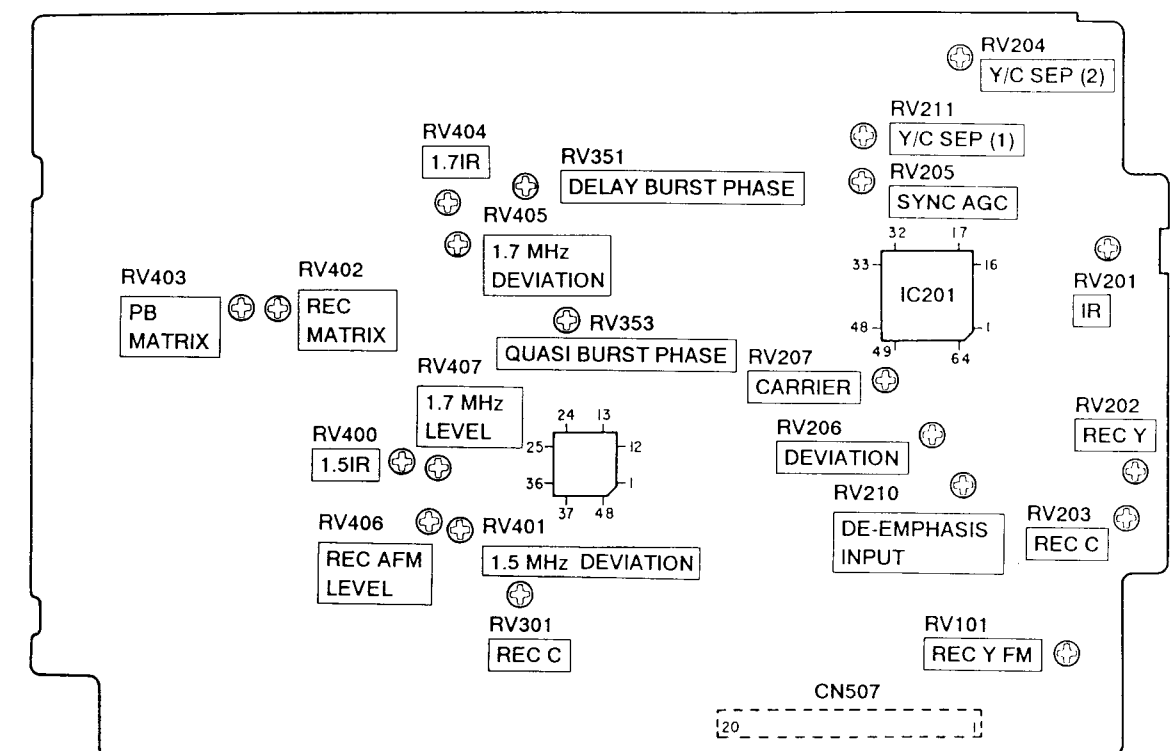
SS-136 BOARD (COMPONENT SIDE)



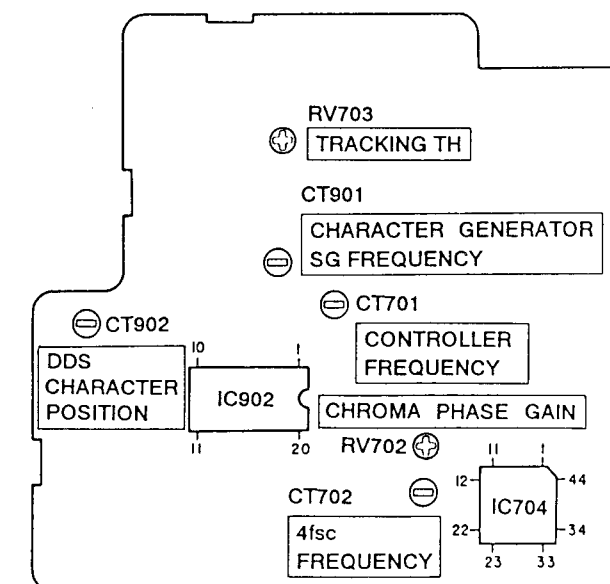
FU-104 BOARD (COMPONENT SIDE)



VA-70 BOARD (COMPONENT SIDE)



CT-40 BOARD (COMPONENT SIDE)
(Also illustrated on page 272.)

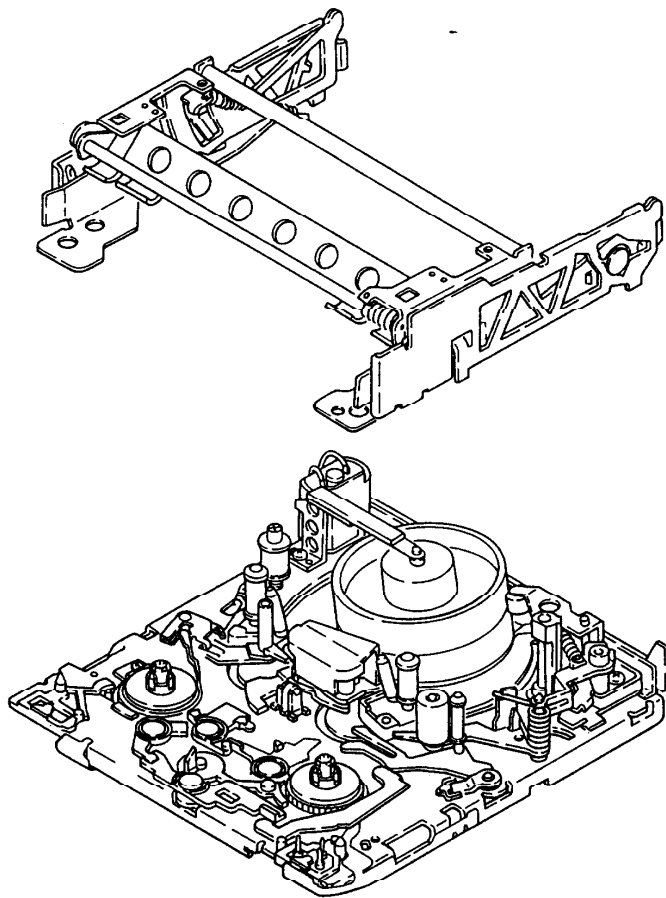


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1. PREPARATIONS FOR MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Note: For removal of the cabinet, the boards, the cassette compartment, etc., refer to the service guides.

1-1. OPERATION WITHOUT CASSETTE COMPARTMENT ASSEMBLY AND TAPE

Note: The unit will not work if exposed to a strong light.

1-1-1. How to Trigger the Loading Operation (See Fig. 1-1.)

- 1) Supply power to the unit after removing the cabinet, the camera block, the cassette compartment assembly, etc., as indicated in the service guides. (This will enable operation of the mechanical deck.)
- 2) Cover the LED assembly with an opaque cap, etc. ①.
- 3) Attach a piece of tape to the RECOG switch ② so that the pin is held down.
- 4) Push the EJECT lever ③ in the direction of the arrow ④.

1-1-2. Setting the Playback Mode (See Fig. 1-1.)

- 1) Follow the procedures in section 1-1-1. above.
- 2) Put the rubber band ⑤ around the S and T reels.
- 3) Press the PLAY switch of unit, then push the tension regulator arm assembly ⑥ in the direction of the arrow ⑦ when the T reel starts to rotate (the tension regulator band will be released, and the S reel will start rotating).
- 4) To stop operation, press the STOP switch.

1-1-3. Eject Operation (See Fig. 1-1.)

- 1) To eject, turn the EJECT switch on.

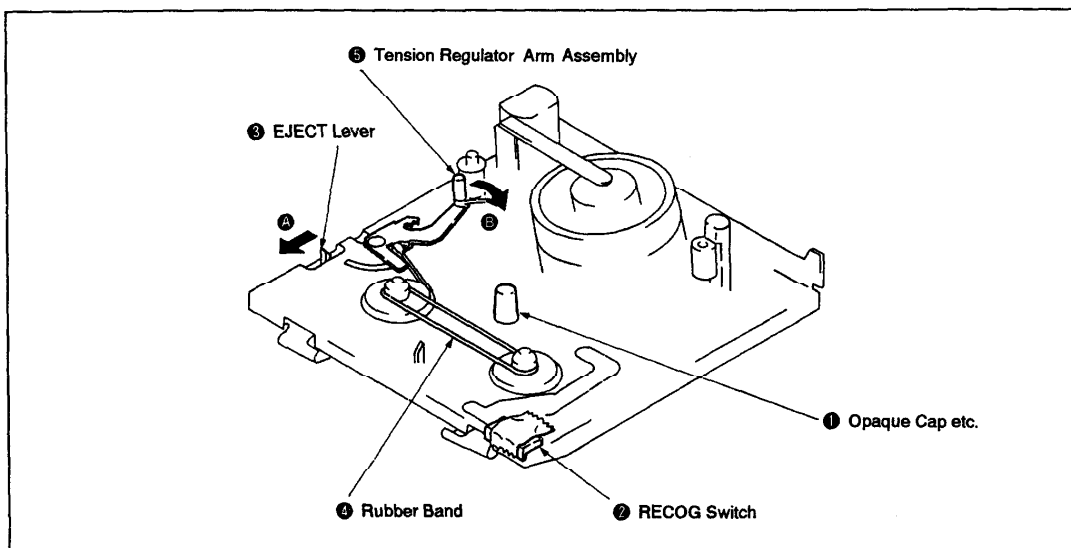


Fig. 1-1.

1-2. THE MODE SELECTOR

1-2-1. Name of Each Part (external) (See Fig. 1-2.)

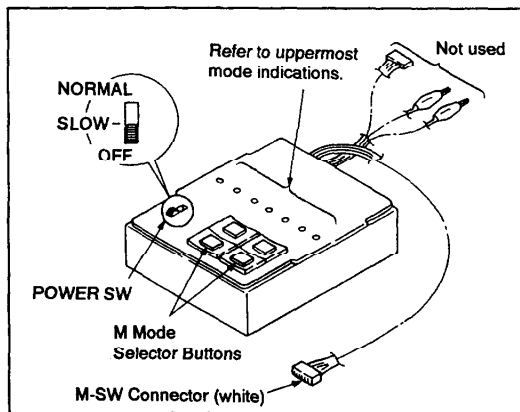


Fig. 1-2.

1-2-2. Connections (See Fig. 1-3.)

- 1) Mount the MODE SELECTOR III panel (Ref. No. J-9) ① onto the mode selector.
- 2) Attach the conversion connector (Ref. No. J-8) ③ of MODE SELECTOR III to the 6-pin connector (white) ② of the mode selector M-SW.
- 3) Remove the FP-89 flexible board ⑤ from the flexible connector ④.
- 4) Attach the FP-89 flexible board ⑤ to the flexible connector ⑥ of the MODE SELECTOR III conversion connector ③, then attach the 2-pin connector (white) ⑦ of the loading motor to the 2-pin connector (white) ⑧.

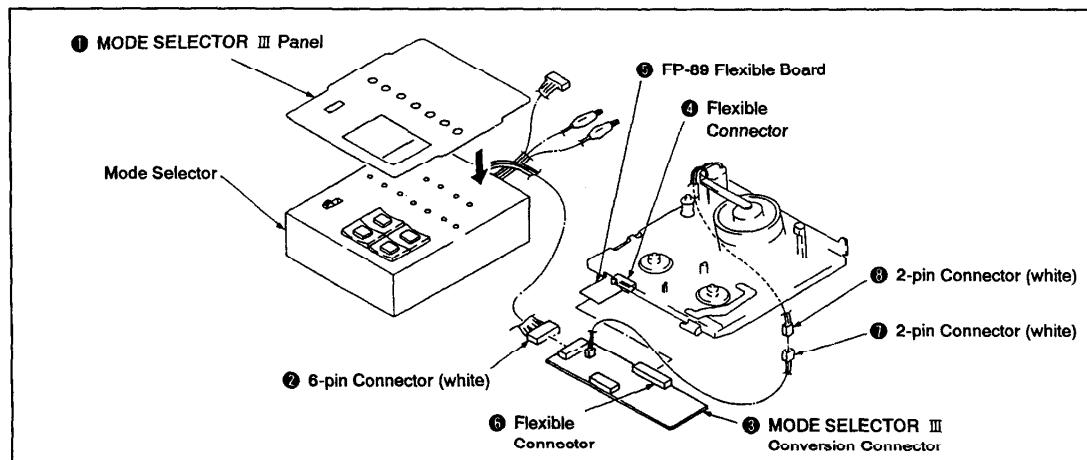


Fig. 1-3.

1-2-3. Handling (See Figs. 1-2. and 1-4.)

- Use only the M mode selector buttons.
- Refer to mode indications on the uppermost part of the MODE SELECTOR III panel.
- If the right M mode selector button is kept pressed, the lit indication will change in the order of EJECT → (IA) → ULD → (IB) → STOP → (IC) → FWD.
- To change modes in the reverse direction (from FWD to EJECT), press the left selector button.

Note: For this U mechanism, the uppermost indicators on the MODE SELECTOR III panel are used. The IA, IB and IC indications light up during mode changes.

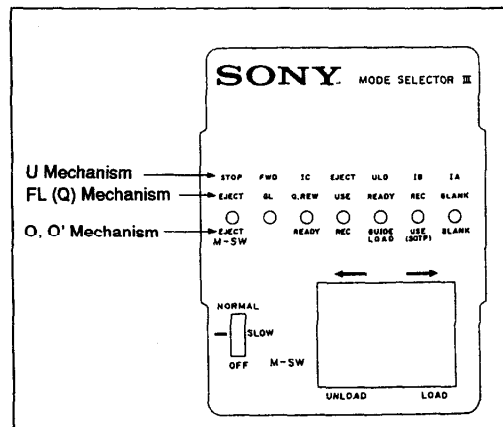


Fig. 1-4.

2. PERIODICAL CHECK AND MAINTENANCE (See Fig. 2-1.)

The following periodical check and maintenance procedures are necessary to ensure proper operation and to protect the tapes as well as the unit, and the following maintenance procedures must be always carried out after repairing regardless of how long the unit has been used.

2-1. ROTARY DRUM ASSEMBLY CLEANING

- 1) While pressing a piece of chamois leather (Ref. No. J-2) moistened in cleaning fluid (Ref. No. J-1) lightly against the rotary drum, turn the rotary upper drum slowly counter-clockwise with your fingers.

Note: Do not drive the drum with the motor, and do not turn it clockwise.

Do not move the chamois leather vertically against the head tip; this can damage the head tip. Strictly follow the cleaning instructions above.

2-2. TAPE PATH CLEANING

- 1) Set the cassette compartment assembly to the eject state, or remove it. Then clean the tape path (guides No. 1 to 7, capstan shaft, pinch rollers) with a piece of chamois leather moistened in cleaning fluid (See Fig. 2-1).

2-3. DRIVE SYSTEM CLEANING

- 1) Clean the drive system (timing belt, reel table surface) with a piece of cloth moistened in cleaning fluid.

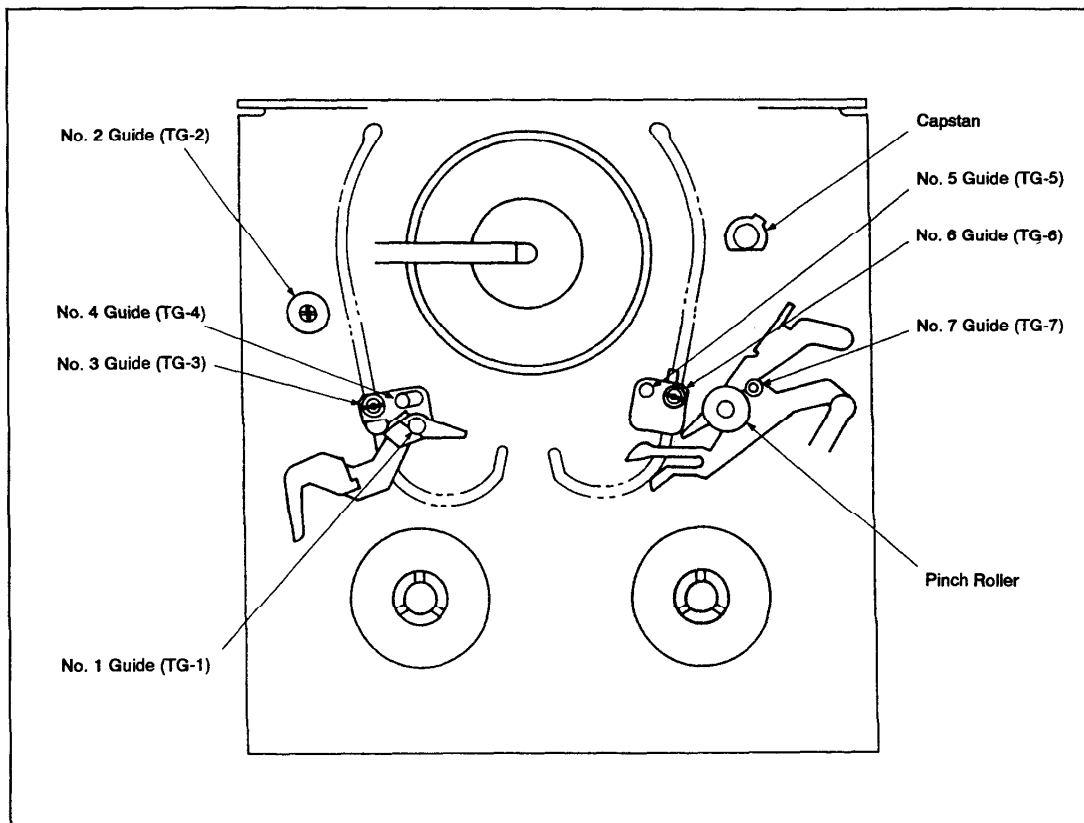


Fig. 2-1.

2-4. PERIODICAL CHECK ITEMS

○ Cleaning ◎ Lubrication ☆ Check

Maintenance and Check Item		Operation time (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Cleaning and Demagnetizing	Tape path surfaces Cleaning	○	○	○	○	○	○	○	○	○	○	Do not oil.
	Rotary drum assembly cleaning and demagnetizing	○	○	○	○	○	○	○	○	○	○	Do not oil.
Drive System	Relay belt (short)	—	☆	—	☆	—	☆	—	☆	—	☆	3-728-866-01
	Relay belt (long)	—	☆	—	☆	—	☆	—	☆	—	☆	3-728-865-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Take care that no oil gets on tape path surfaces.
	Idler pulley axle	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	1-541-612-11
Performance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD, RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

Notes: When overhauling the unit, perform parts replacement referring to the table above.

Regarding Oil:

- Always use the specified oil (using oil of different viscosity, etc. can cause troubles of several kinds).
Specified oil: Part No. 7-661-018-01
(Mitsubishi Diamond Oil Hydrofluid EP56)
- Be sure that no dirt is mixed in the oil to be used on axle bearings. Use of dirty oil can result in bearing wear and burning.
- By "one drop of oil" is meant the quantity of oil adhering to the end of a 2mm-diameter rod as shown in Fig. 2-2.

On grease:

- Use the specified grease.
Grease: Part No. 7-662-010-08
(Sony grease SGL-701)

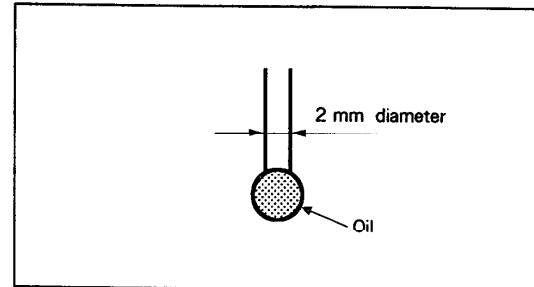
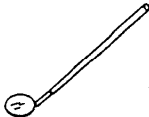
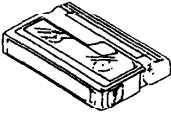
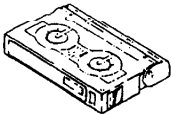
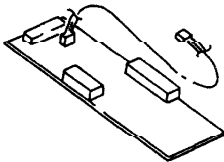
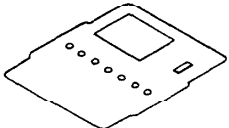
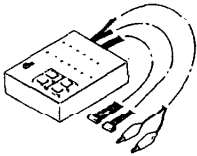
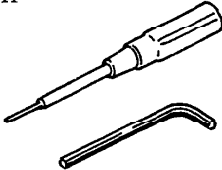
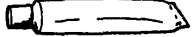


Fig. 2-2.

2-5. SERVICING TOOLS

Ref. No.	Name	Part Code	Marking	Application, etc.
J-1	Cleaning fluid	Y-2031-001-0	—	
J-2	Chamois cloth	2-034-697-00	—	
J-3	Head demagnetizer	Commercially available	—	
J-4	Dental mirror Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-5	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-6	FWD/RVS takeup torque cassette	J-6080-624-A	GD-2086	
J-7	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-8	Mode selector III conversion connector	J-6082-021-A		General
J-9	Mode selector III panel	J-6082-023-A		General
J-10	Mode selector	J-6080-825-A		General
J-11	Hexagonal wrench detection (0.89 mm) or L wrench (0.89 mm)	7-700-766-01 7-700-736-06		Tape path
J-12	Sony grease (SGL-701)	7-662-010-08		

Other devices: Oscilloscope
Analog tester (20 k Ω)

J-1 	J-2 	J-3 	J-4 
J-5 	J-6 	J-7  (Attached to the maintenance rotary upper drum)	J-8 
J-9 	J-10 	J-11 	J-12 

3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

- Notes:**
- Use the mode selector (Ref. No. J-10) for procedures in this chapter.
 - Modes within a frame are those set by pressing the buttons of the mode selector.

3-1. HC ROLLER ASSEMBLY

1. Removal (See Fig. 3-1.)

- 1) Remove the screw ①, then remove the HC roller assembly ②.

2. Installation (See Fig. 3-1.)

- 1) Align the two dowels ③ attached to the HC roller assembly ② with the two holes ④ in the mechanism chassis.
- 2) Secure the HC roller assembly ② with the screw ①.

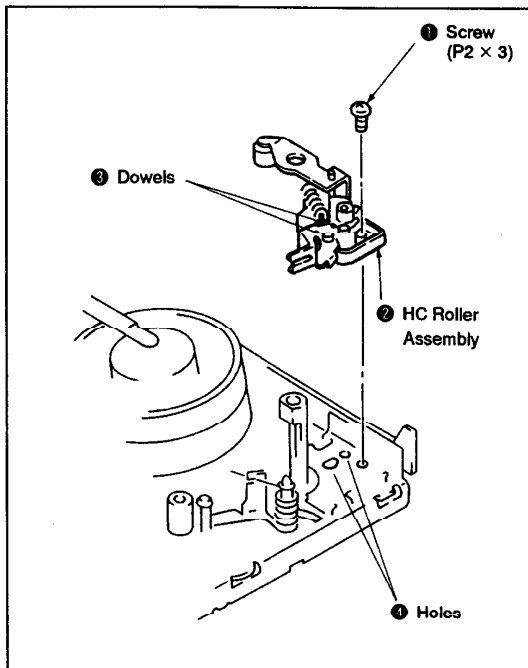


Fig. 3-1.

3-2. GUIDE GUARD ASSEMBLY

1. Removal (See Fig. 3-2.)

- Remove the screw ①, then remove the guide guard assembly ②.

2. Installation (See Fig. 3-2.)

- 1) Align the dowel ③ attached to the guide guard assembly ② with the hole ④.
- 2) Secure the guide guard assembly ② with the screw ①.

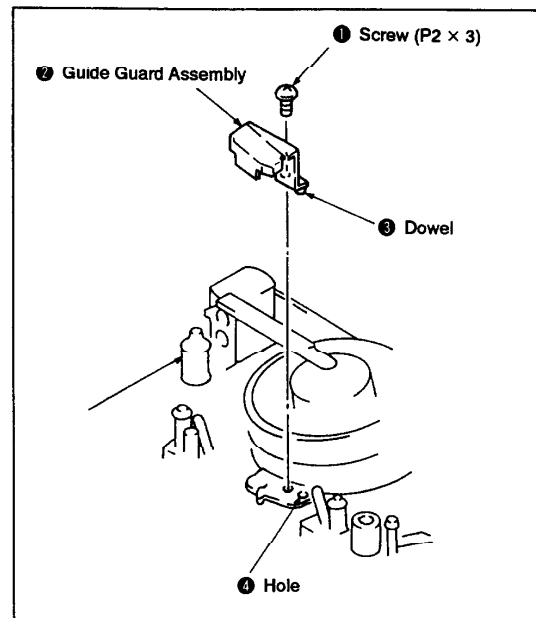


Fig. 3-2.

3-3. DC MOTOR (CAPSTAN MOTOR) ASSEMBLY

1. Removal (See Fig. 3-3.)

- 1) Set the **ULD** mode.
- 2) Turn the stopper ① in the direction of the arrow ④ as far as it will go.
- 3) Remove the two screws ②, then remove the DC motor ③.

2. Installation (See Fig. 3-3.)

- 1) Align the two screwed dowels ④ with the two holes ⑤, then engage the toothed part ⑥ with the connecting gear ⑦.
- 2) Secure the DC motor assembly ③ with the two screws ②.
- 3) Turn the stopper ① in the direction of the arrow ⑤ as far as it will go.

Note:

- When engaging the gears, take care not to damage their teeth.
- Do not leave any clearance between the DC motor ③ and the chassis.
- Do not touch the capstan motor axle*, the oil seal* and the rotor*.

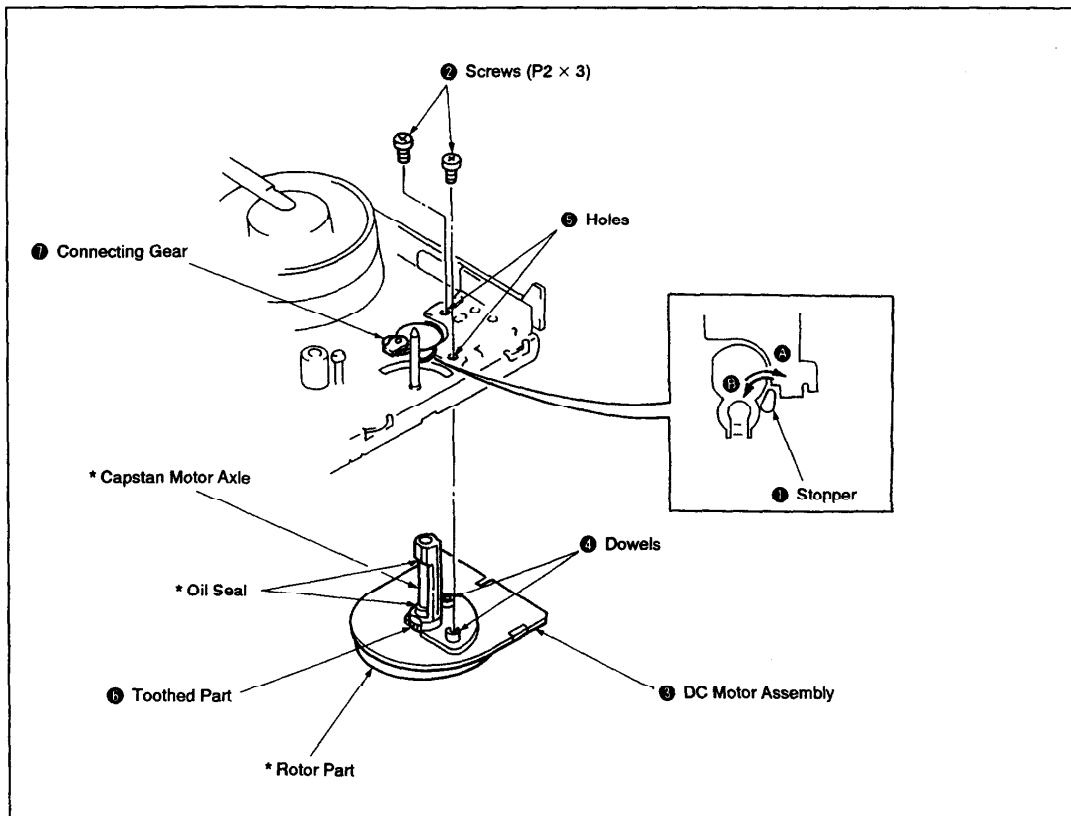


Fig. 3-3.

3-4. S BRAKE, T BRAKE

1. Removal (See Fig. 3-4.)

- 1) Remove the torsion coil spring (ST) ①.
- 2) Remove the axle holding pin ②, then remove the T brake ③.
- 3) Remove the axle holding pin ④, then remove the S brake ⑤.

2. Installation (See Fig. 3-4.)

- 1) While fitting the toothed part ⑥ into the notch ⑦, mount the S brake ⑤.
- 2) Insert the axle holding pin ②.
- 3) Insert the axle ⑧ to the S reel side of the brake release arm ④ so that the ④ part comes closer to the drum than part ③, and mount the T brake ③.
- 4) Insert the axle holding pin ④.
- 5) Insert the torsion coil spring (ST) ① below the claw ⑩ of the axle ⑩, then hook it to two claws ⑪.

Note: Confirm that the claws of axle holding pins ② and ④ are not broken before assembling.

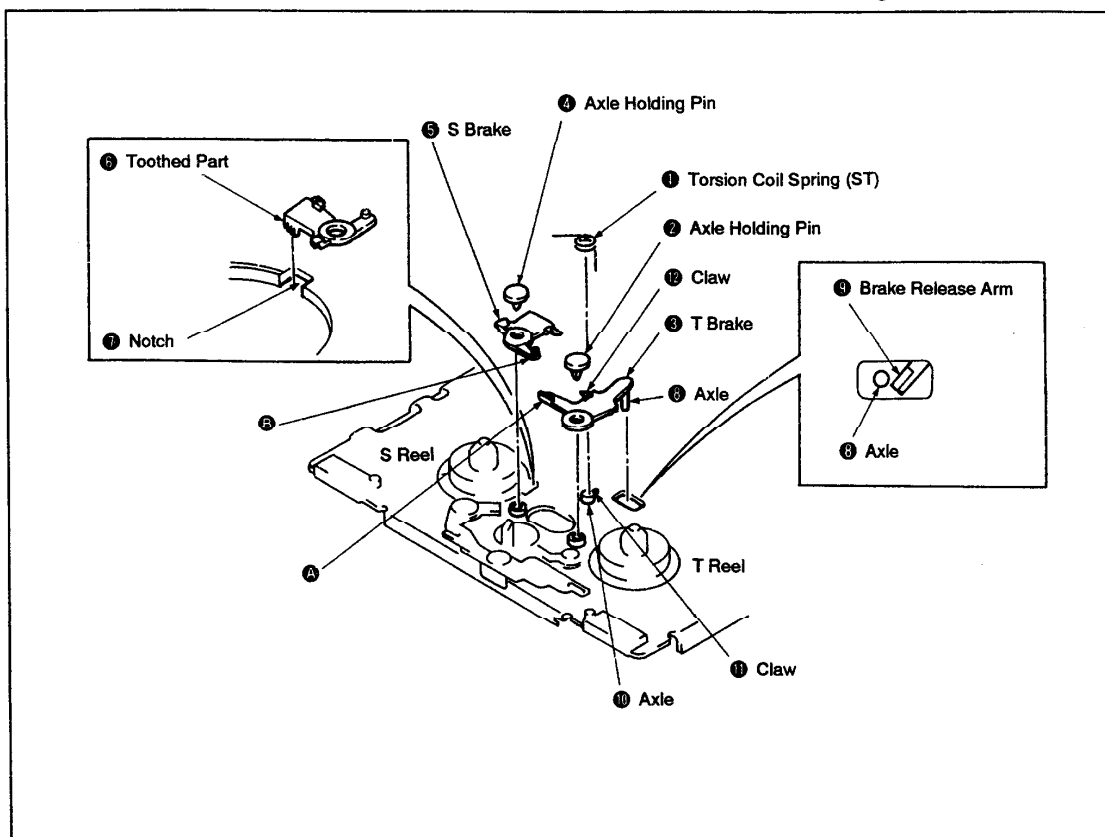


Fig. 3-4.

3-5. LB BRAKE, AXLE HOLDING PINS

1. Removal (See Fig. 3-5.)

- 1) Remove the screw ①, then remove the TL holding plate ②.
- 2) Remove the axle holding pin ③, then remove the LB brake ④.
- 3) Remove the axle holding pin ⑤, then remove the LB lever ⑥.

2. Installation (See Fig. 3-5.)

- 1) Mount the LB lever ⑥ matching it to pin ⑦ of the LB gear, then secure it with the axle holding pin ⑤.
- 2) Insert the pin ③ into the notch ⑨ of the LB lever ⑥, then mount the LB brake ④ while inserting the toothed part ⑩ into the notch ⑪.
- 3) Insert the axle holding pin ③.
- 4) Align the dowel ⑫ with the hole ⑬, then mount the TL holding plate and secure it with the screw ①.

Note: Confirm that the claws of axle holding pins ③ and ⑤ are not broken before assembling.

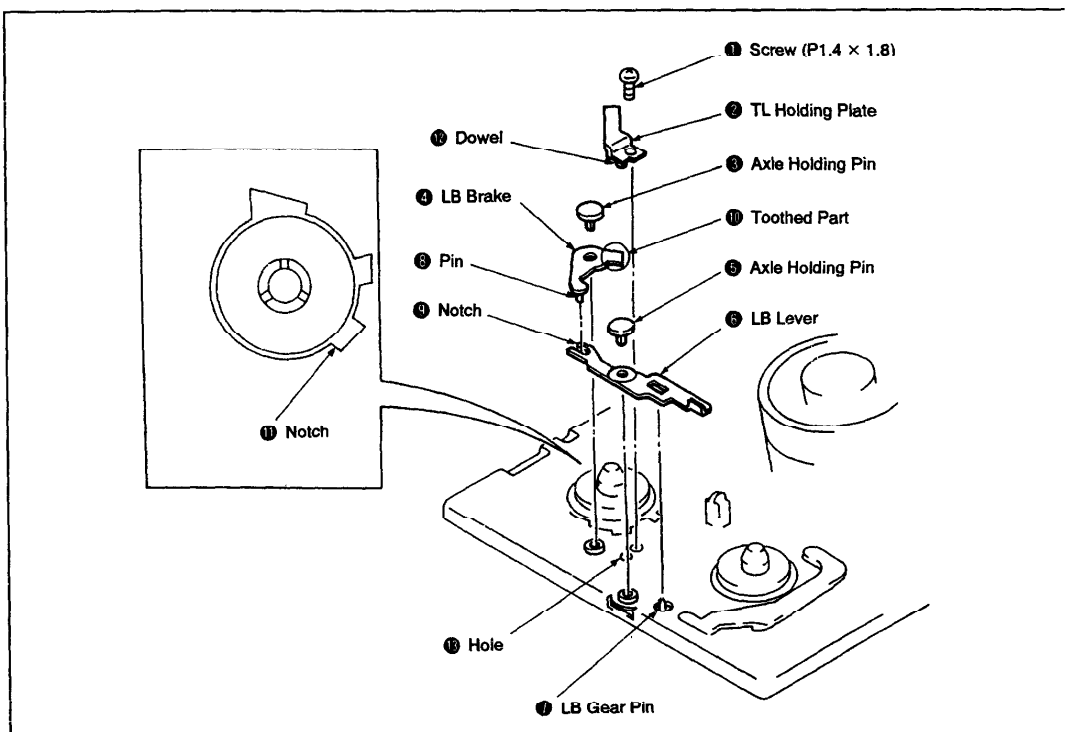


Fig. 3-5.

3-6. LB RELEASE ARM

1. Removal (See Fig. 3-6.)

- 1) While pushing the claw ① in the direction of the arrow, remove the LB release arm ②.

2. Installation (See Fig. 3-6.)

- 1) Fit the LB release arm ② to the axle ③, insert protrusions ⑤, ⑥, ⑦, ⑧ into the three holes ④, then secure with the claw ①.

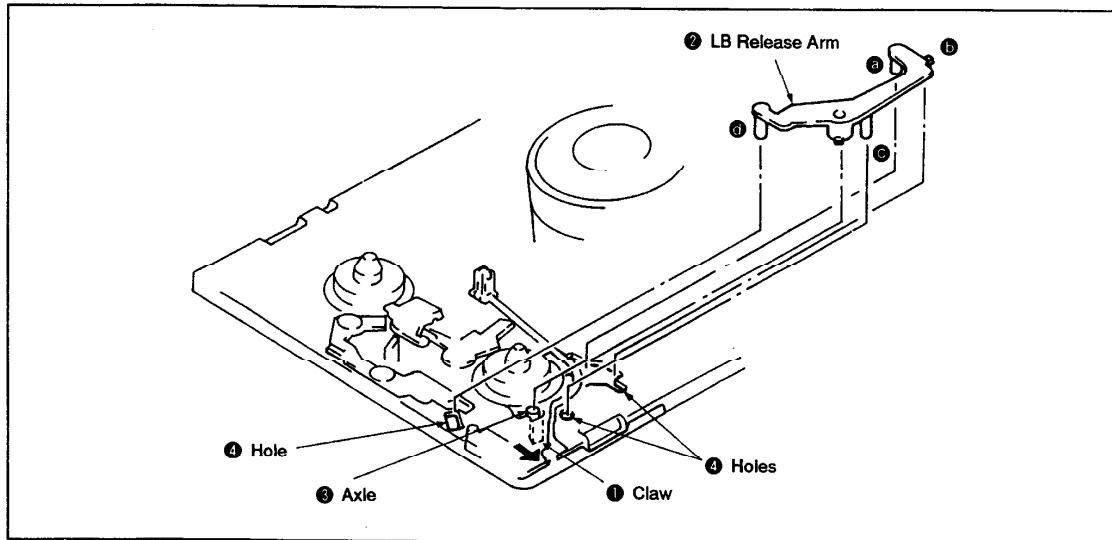


Fig. 3-6.

3-7. RK STOPPER, RK STOPPER ARMS

1. Removal (See Fig. 3-7.)

- 1) Remove the torsion coil spring (RK) ①.
- 2) Open the chassis claw ②, then remove the RK stopper arm ③.
- 3) Remove the RK stopper ④.

2. Installation (See Fig. 3-7.)

- 1) Mount the RK stopper ④ onto the axle ⑤.
- 2) Mount the RK stopper arm ③ onto the axle ⑥, insert Pin ⑩ into hole ⑪, then hook the claw ② of the chassis to the hole ⑦.
- 3) Insert the torsion coil spring (RK) ① into the axle ⑤, then hook it to claws ⑧ and ⑨.

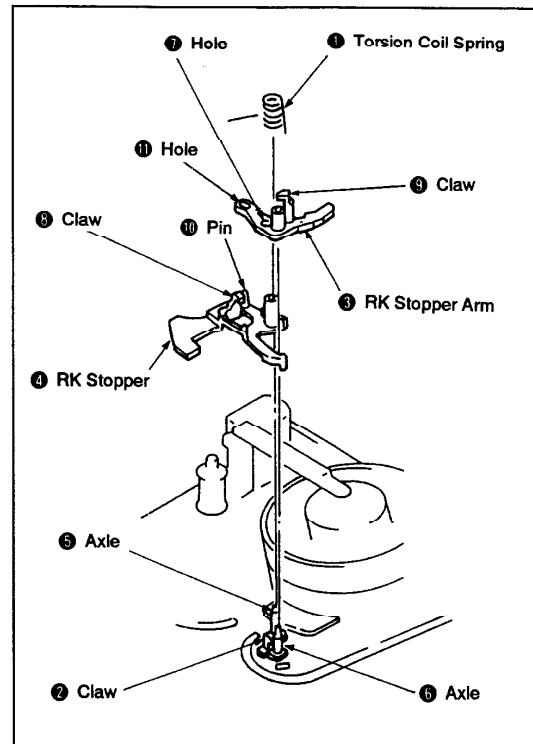


Fig. 3-7.

3-8. PINCH ARM ASSEMBLY, TG-7 ASSEMBLY

1. Removal (See Fig. 3-8.)

- 1) Set the **[B]** mode.
- 2) Remove the stopper washer ①, then remove the pinch arm assembly ②.
- 3) Bend the claw ④ inside hole ③ in the direction of the arrow using a thin screwdriver or the like, then remove the TG-7 plate spring ⑤.
- 4) Remove the TG-7 arm assembly ⑥.

2. Installation (See Fig. 3-8.)

- 1) Grease the inner surfaces of hole ⑦ (See Fig. A).
- 2) Insert the axle ⑨ of the TG-7 arm assembly ⑥ into the hole ⑦.
- 3) Grease the shaded section ⑧ (See Fig. A).
- 4) Insert the TG-7 plate spring ⑤ into the hole ③, then secure it with the claw ④.
- 5) Apply half a drop of oil to the axle ④ (See Fig. B).
- 6) Fit the pinch arm assembly ② to the axle ④ and insert the pinch roller sub arm assembly tab ⑩ into the ⑪ part.
- 7) Install the stopper washer ①.

Note:

- Take care not to grease the screw ⑪ of the TG-7 arm assembly ⑥ (See Fig. A).
- When fitting the pinch arm assembly ② to the axle ④, make sure that it does not touch the TG-7 guide ⑫ or the rubber roller ⑬.
- After assembling, be sure to perform tape path adjustment as described in section 4.

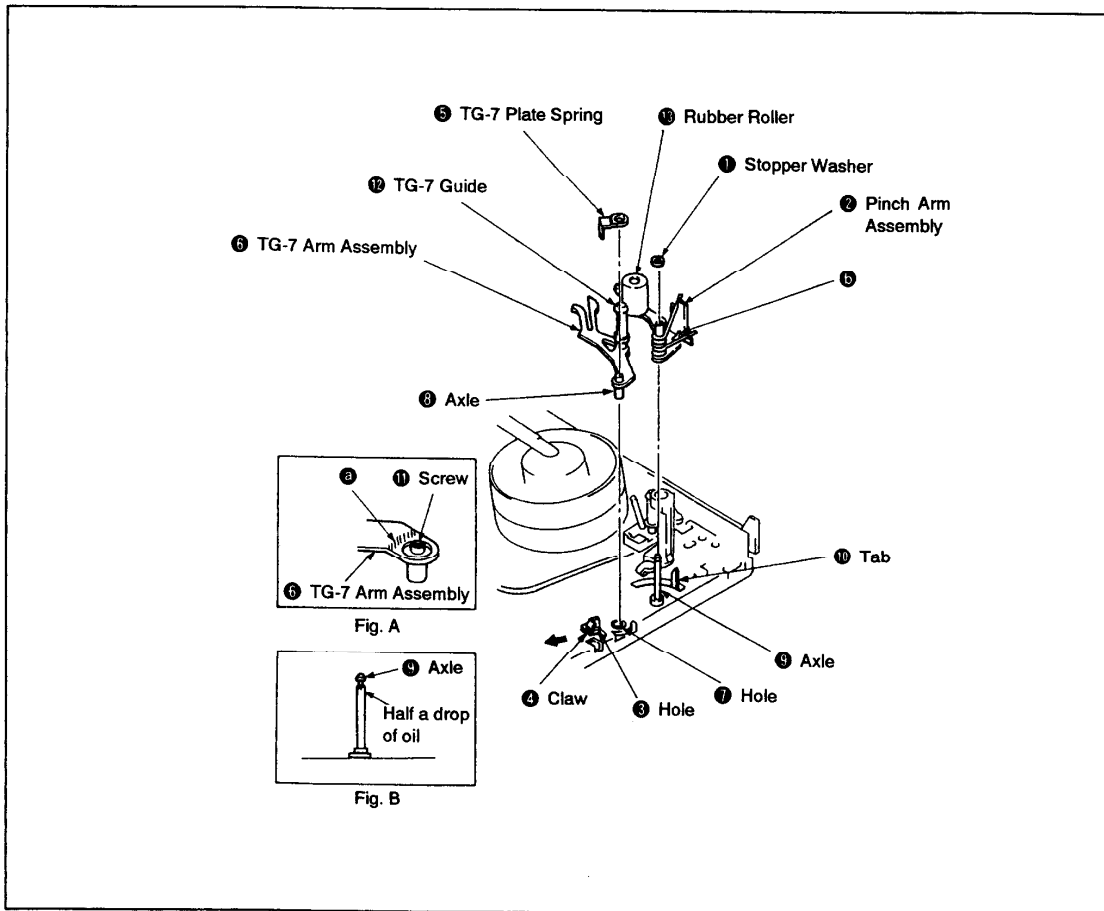


Fig. 3-8.

3-9. TG-2 ASSEMBLY

1. Removal (See Fig. 3-9.)

- 1) Remove the TG-2 upper flange assembly ①.
- 2) Remove the TG-2 roller ②, the TG-2 sleeve ③, the TG-2 lower flange ④ and the compression spring ⑤.

2. Installation (See Fig. 3-9.)

- 1) Mount the compression spring ⑤, the TG-2 lower flange ④, the TG-2 sleeve ③ and the TG-2 roller ② to the axle.
- 2) Secure the TG-2 upper flange ① to the axle by rotating it 4 to 6 turns.

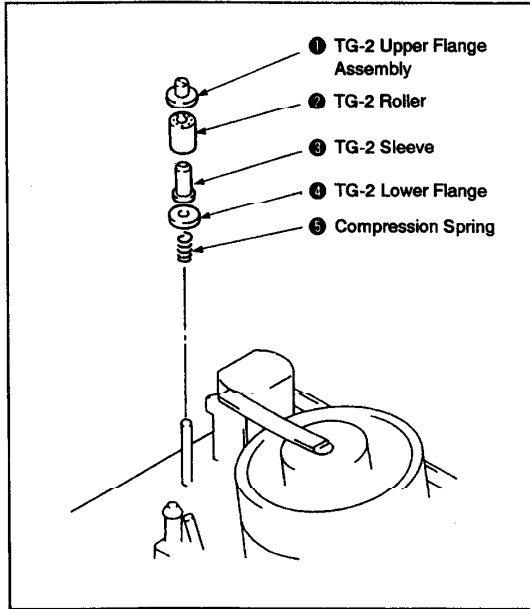


Fig. 3-9.

3. TG-2 Height Preset (see Fig. 3-10.)

- 1) Adjust height from the mechanism chassis upper surface to the TG-2 upper flange ① upper surface to 18.6 mm by turning the TG-2 upper flange ①.

Note: After adjustment, be sure to perform tape path adjustment as described in section 4.

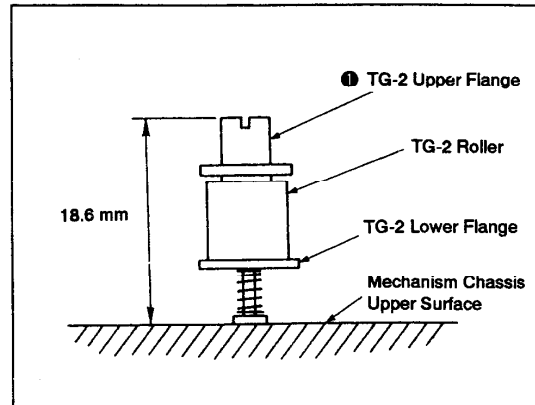


Fig. 3-10.

3-10. S REEL TABLE ASSEMBLY, T REEL TABLE ASSEMBLY

1. Removal (See Fig. 3-11.)

- 1) Remove the S brake and T brake as described in section 3-4.
- 2) Remove the TL holding plate as described in section 3-5.
- 3) Remove the tension regulator band assembly as described in section 3-11.
- 4) Remove the S reel table assembly ①.
- 5) Turn the stopper ② approx. 90° in the direction of the arrow ③.
- 6) While sliding the LB release arm ④ in the direction of the arrow ⑤, remove the T reel table assembly ⑥.

2. Installation (See Fig. 3-11.)

- 1) Apply half a drop of oil to the axle ⑦ (See Fig. A).
- 2) Move the RK gear ⑧ in the direction of the arrow ⑨ and the TS brake ⑦ in the direction of the arrow ⑩, putting them out of the way.
- 3) While sliding the LB release arm ④ in the direction of the arrow ⑤, mount the T reel table assembly ⑥ onto the axle ⑦, then turn the stopper ② in the direction of the arrow ③ as far as it will go.
- 4) Apply half a drop of oil to the axle ⑧ (See Fig. B).
- 5) Move the RK gear ⑧ in the direction of the arrow ⑨, the UL brake ④ in the direction of the arrow ⑥ and the LB brake ⑩ in the direction of the arrow ⑪, putting them out of the way.
- 6) Mount the S reel table ① onto the axle ⑧.
- 7) Mount the tension regulator band assembly as described in section 3-11.
- 8) Mount the TL holding plate as described in section 3-5.
- 9) Mount the S brake and T brake assemblies as described in section 3-4.

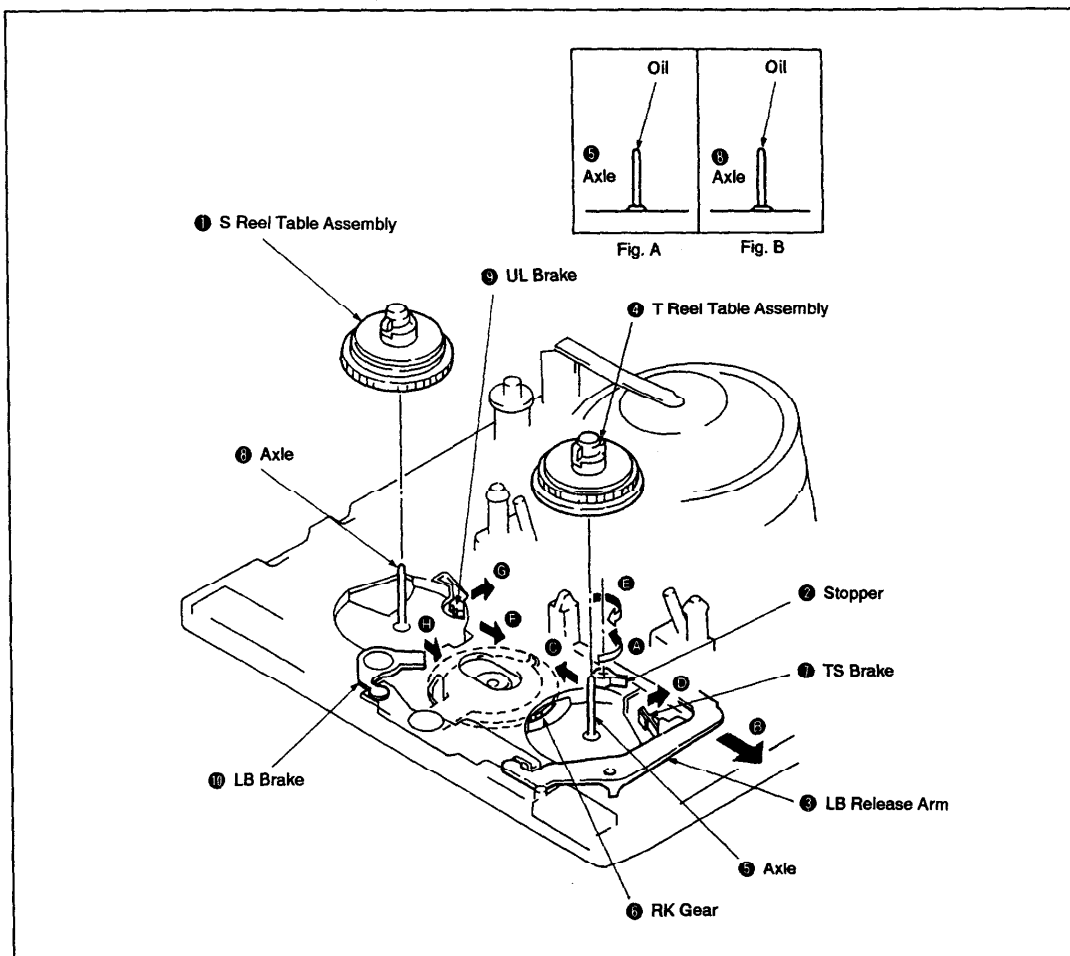


Fig. 3-11.

3-11. TENSION REGULATOR BAND ASSEMBLY, TENSION REGULATOR ARM ASSEMBLY

1. Removal (See Fig. 3-12.)

- 1) Remove the TL holding plate as described in section 3-5.
- 2) Remove the screw ①.
- 3) Using a thin screwdriver or the like, remove the tension regulator band assembly ④ from the axle ③ of tension regulator arm assembly ②.
- 4) Remove the tension spring ⑤.
- 5) Remove the stopper washer ⑥ from the back of the mechanism chassis, then remove the tension regulator arm assembly ②.
- 6) Open the claw ⑦, then remove the adjust arm ⑧.

Note: When removing the tension regulator band assembly ④, take care not to twist or bend it, and not to touch the felt surface ⑨.

2. Installation (See Fig. 3-12.)

- 1) Engage the adjust arm ⑧ in the position shown in Fig. A, then close the claw ⑦.
- 2) Apply half a drop of oil to the hole ⑩.
- 3) Mount the tension regulator arm assembly ②, then insert it into the slot ⑪ so that the ② part comes to the arrow A side of the switch lever assembly (See Fig. B).

- 4) While holding the tension regulator arm assembly ② from the mechanism chassis front, secure it with the stopper washer ⑥ from the back.
- 5) Hook the R hook of the tension spring ⑤ to the adjust arm ⑧ as shown in the figure, then hook the opposite end to the tension regulator arm assembly ②.
- 6) Mount the tension regulator band assembly ④ onto the axle ③ of tension regulator arm assembly ②, and place it so that the felt surface ⑨ comes against the shaded portion of the S reel table assembly ⑬.
- 7) Mount the tension regulator plate ⑭ of the tension regulator band assembly ④ so that it is aligned with the dowel ⑫ of the mechanism chassis, then secure it temporarily with the screw ①.
- 8) Mount the TL holding plate as described in section 3-5.
- 9) Adjust tension regulator FWD position as described in section 3-12.
- 10) Perform adjust arm adjustment as described in section 3-22.

Note: When mounting the tension regulator band assembly ②, take care not to twist or bend it, and not to touch the felt surface ⑨.

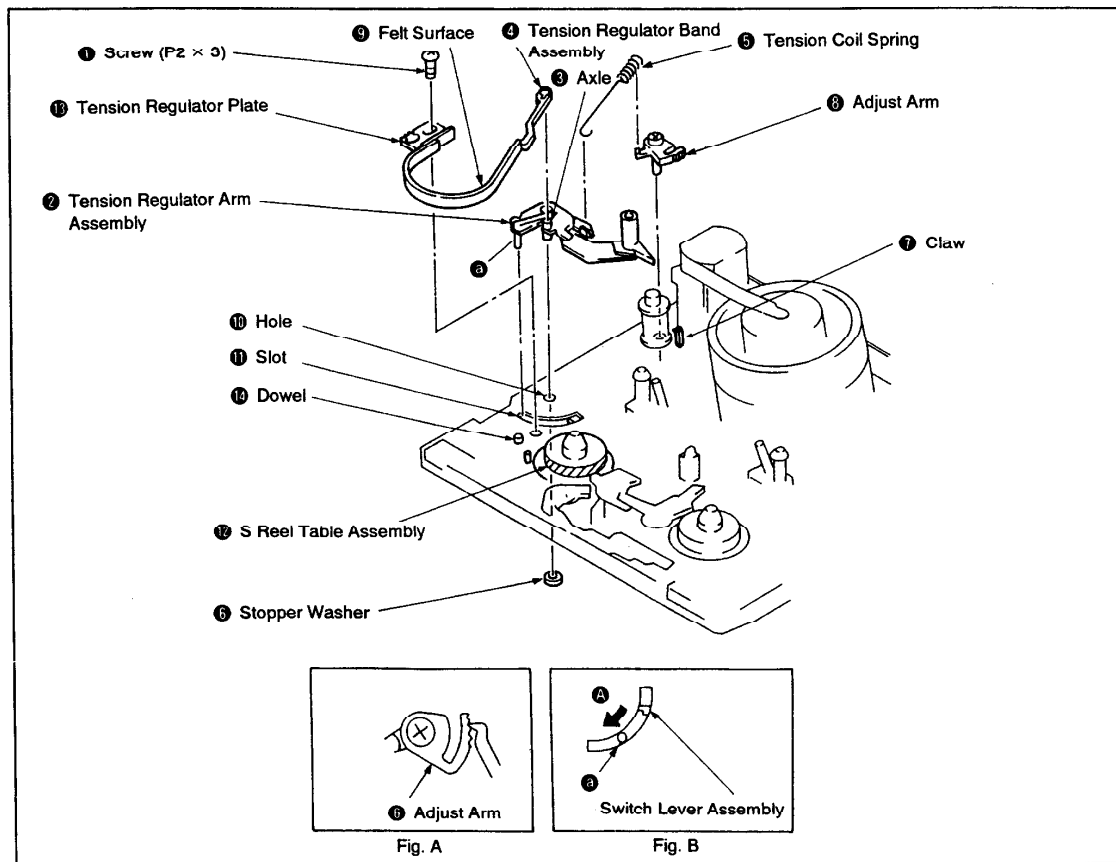


Fig. 3-12.

3-12. TENSION REGULATOR FWD POSITION PRESET (See Fig. 3-13.)

- 1) Load a cassette tape and set the **[FWD]** mode.
- 2) Confirm whether the distance between ❶ part of the tension regulator arm and the groove ❷ of the chassis is 1.1 ± 0.3 mm. If this distance is not within the specified range, remove the cassette tape and perform the following adjustment.
- 3) Loosen the fixing screw ❹ of the tension regulator band assembly ❸.
- 4) Slide the tension regulator plate ❺ in the direction of the arrow ❸ if the measured distance is over the specified range, and in the direction of the arrow ❹ if it is under that range. Then, fix it with the screw ❹.
- 5) Repeat steps 1) and 2) and confirm that the distance is within the specified range.

Note: Use a cassette with the tape advanced halfway.

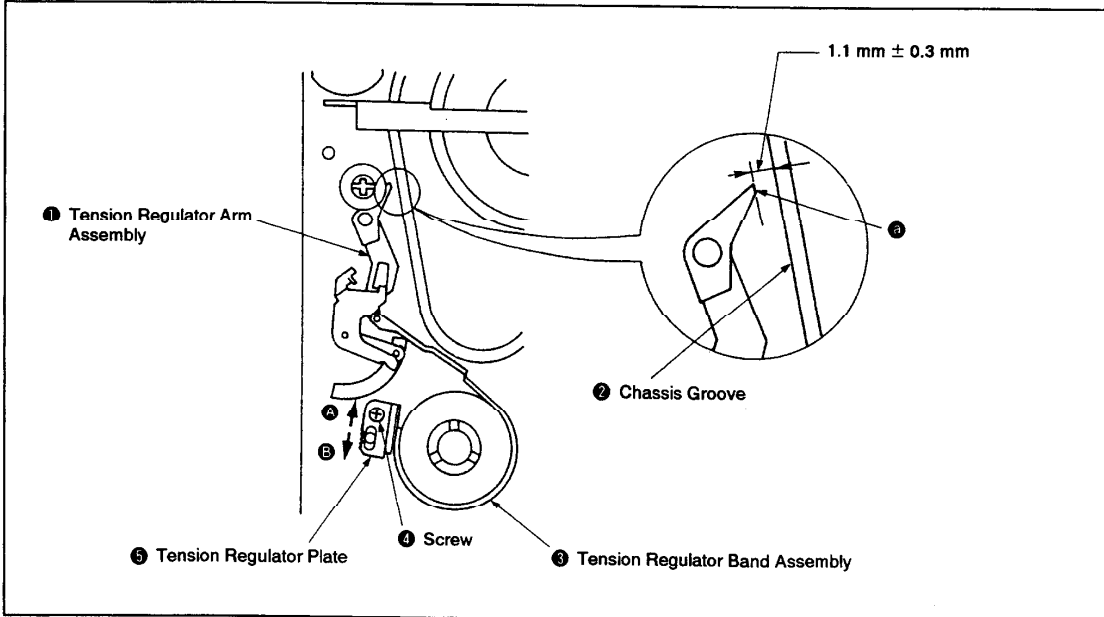


Fig. 3-13.

1. Removal (See Fig. 3-14.)

- Note:**
- When removing the drum assembly ⑥ from the mechanism chassis, take care not to cut the flexible board ① or the harness.
 - Take care not to touch the head tip ⑨.

- 1) Insert part **A** of the dew sensor **8** into the notch **11** of the mechanism chassis, then secure it with the screw **7**.
- 2) Mount the connector **10**.
- 3) Clamp the harness **15** of the dew sensor **8** with the reinforcing the claw **16** of the plate SS assembly (See Fig. A).
- 4) Insert the connector **2** and the flexible board **1** into the hole **12** of the mechanism chassis, align the drum assembly **6** with the two dowels **13** and secure it with the three screws **5**.
- 5) Align the axle ground terminal **2** with the two dowels **14** of the mechanism chassis and secure it with the screw **3**.
- 6) Mount the guide guard assembly as described in section 3-2.
- 7) Mount the two connectors **2** and the flexible board **1**.

-
- This diagram illustrates the assembly of the drum unit onto the base plate. The components are labeled as follows:
- 1** Flexible Board
 - 2** Connectors
 - 3** Screw (P2 × 3)
 - 4** Head Tip
 - 5** Drum Assembly
 - 6** Axle Ground Terminal
 - 7** Screw (P1.4 × 1.8)
 - 8** Dew Sensor
 - 9** Dowels
 - 10** Connector
 - 11** Notch
 - 12** Hole
 - 13** Dowels
 - 14** Screw (P2 × 3)
- An inset diagram, labeled **Fig. A**, provides a detailed view of the connection between the **15** Harness and the **16** Claw.

— 18 —

3-14. EJECT LEVER, SWITCH LEVER ASSEMBLY, PINCH ROLLER SUB ARM ASSEMBLY

1. Removal (See Fig. 3-15.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Set the **STOP** mode.
- 3) Remove the claw ①, then remove the eject lever ②.
- 4) Remove the stopper washer ③, then remove the switch lever assembly ④.
- 5) Remove the pinch roller load spring ⑤.
- 6) Remove the stopper washer ⑥, then remove the pinch roller sub arm assembly ⑦.

2. Installation (See Fig. 3-15.)

- 1) Grease the axle ⑧ (See Fig. A).
- 2) Assemble by inserting ⑧ part of the pinch roller sub arm assembly ⑦ into the slot ⑨, then insert the pin ⑩ into the loading lever assembly notch ⑪.
- 3) Secure with the stopper washer ③.

- 4) Mount the pinch roller load spring ⑤ by catching its ⑫ end between the claw ① and the chassis side and its ⑬ end to the claw ①.
- 5) Apply half a drop of oil to the axle ⑭ (See Fig. B).
- 6) Align the groove ⑮ of the switch lever assembly ④ with the mode detector switch protrusion ⑯, mount it on the axle ⑭, then insert the pin ⑩ into the drive gear (left) assembly ⑰ outer groove.
- 7) Secure with the stopper washer ③.
- 8) Mount the eject lever ② and close the claw ①.
- 9) Mount the DC motor (capstan motor) as described in section 3-3.

Note: When mounting the switch lever assembly ④ onto the axle ⑭ with the tension regulator arm assembly installed, set the pin ⑩ to the arrow ② side of the switch lever assembly ④.

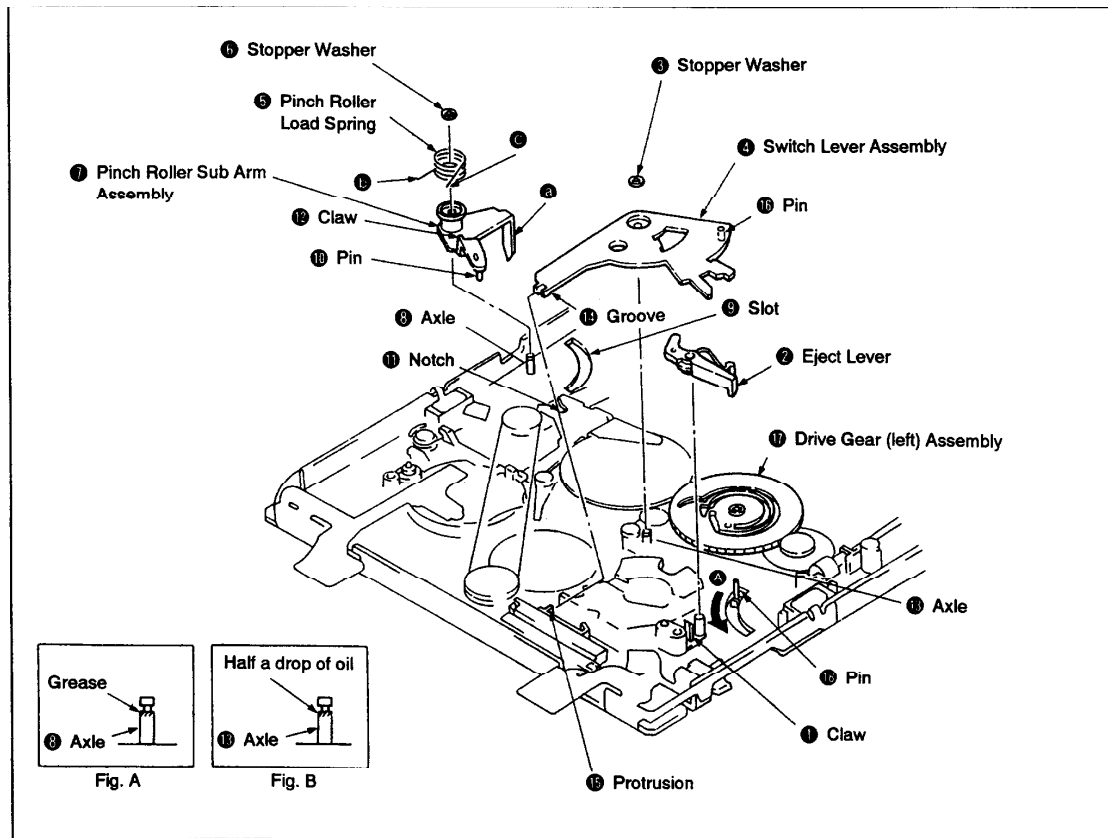


Fig. 3-15.

3-15. TIMING BELT (L) , RC GEAR ASSEMBLY, LOADING LEVER ASSEMBLY, TIMING BELT (S), CONNECTING GEAR ASSEMBLY

1. Removal (See Fig. 3-16.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the pinch roller sub arm assembly as described in section 3-14.
- 3) Set the **STOP** mode.
- 4) Remove the stopper washer ①, then remove the RC gear assembly ② from the axle ④ with the timing belt (L) ③ attached.
- 5) Remove the timing belt (L) ③ from the idler pulley assembly ⑤.
- 6) Remove the stopper washer ⑥ and remove the loading lever assembly ⑧ while pushing the claw ⑦ in the direction of the arrow A.
- 7) Turn the stopper ⑨ approx. 90° in the direction of the arrow B.
- 8) Remove the connecting gear assembly ⑪ from the axle ⑩ with the timing belt (S) ⑩ attached.
- 9) Remove the timing belt (S) ⑩ from the idler pulley assembly ⑤.

Note: When removing the connecting gear ⑪, take care not touch the flange section ⑬.

2. Installation (See Fig. 3-16.)

- 1) Apply half a drop of oil to the axle ⑩ (See Fig. F).
- 2) Hook one end of the timing belt (S) ⑩ onto the connecting gear assembly ⑪ and the other end onto gear ④ of the idler pulley assembly ⑤. (Refer to the figure.)
- 3) Mount the connecting gear assembly ⑪ with the timing belt (S) ⑩ attached to the axle ⑩.
- 4) Turn the stopper ⑨ in the direction of the arrow C as far as it will go.
- 5) Apply half a drop of oil to the axle ⑩ (See Fig. A).
- 6) Fit the loading lever assembly ⑧ to the axle ⑩, secure the ⑪ part with the claw ⑦ and place the pin ⑬ into the groove of the drive gear (right) assembly ⑫.
- 7) Install the stopper washer ⑥.
- 8) Place the timing belt (L) ③ around the gears of the RC gear assembly ② indicated in Fig. B, and its opposite side around the gear ④ of the idler pulley assembly ⑤. (See Fig. E.)
- 9) Mount the RC gear assembly ② onto the axle ④ with the timing belt (L) ③ attached, and engage it with the gear of the RK gear assembly ⑬.
- 10) Install the stopper washer ⑥.
- 11) Grease parts of the loading lever assembly ⑧ indicated in Fig. C.
- 12) Mount the pinch roller sub arm assembly as described in section 3-14.
- 13) Mount the DC motor (capstan motor) as described in section 3-3.

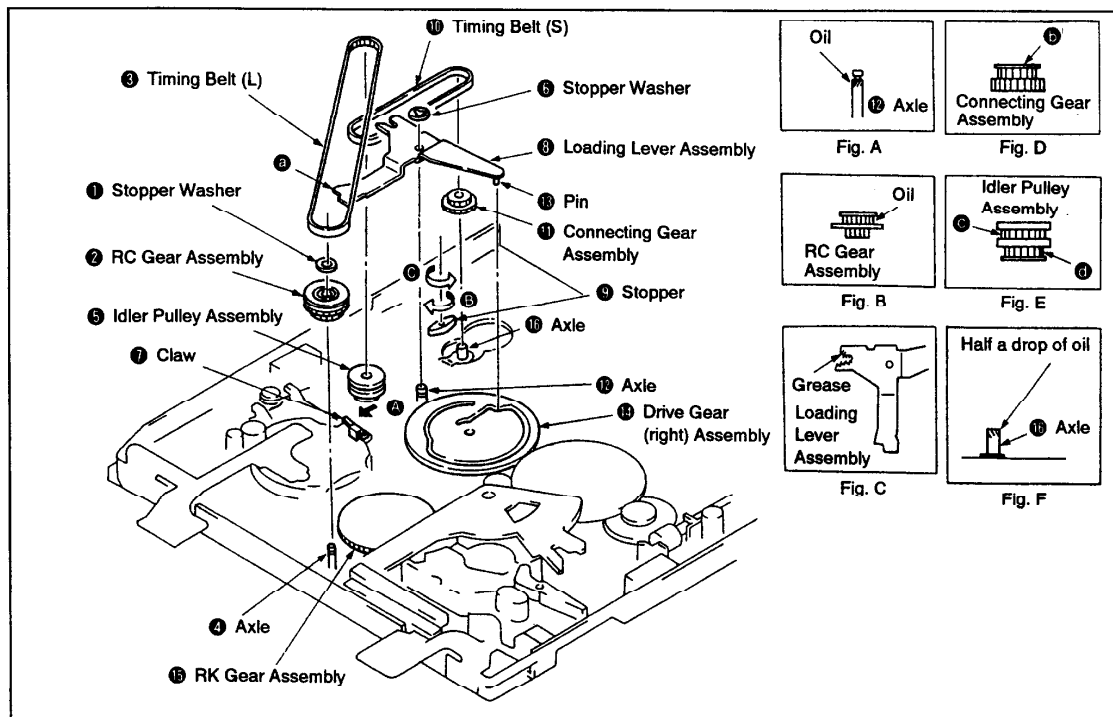


Fig. 3-16.

3-16. IDLER PULLEY, TS BRAKE ASSEMBLY, LB GEAR ASSEMBLY, RK GEAR ASSEMBLY

1. Removal (See Fig. 3-17.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the switch lever assembly as described in section 3-14.
- 3) Remove the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly described in section 3-15.
- 4) Set the **STOP** mode.
- 5) Remove the stopper washer ①, then remove the idler pulley ②.
- 6) Open the claw ③, then remove the TS brake assembly ④.
- 7) Remove the torsion coil spring (LB) ⑤.
- 8) Remove the stopper washer ⑥, then remove the LB gear assembly ⑦.
- 9) Remove the RK gear assembly ⑧.

Note: When removing the idler pulley ②, take care not to touch the flange section ②. (See Fig. C.)

2. Installation (See Fig. 3-17.)

- 1) Apply half a drop of oil to the axle ⑨ (See Fig. A).
- 2) Mount the RK gear assembly ⑧ onto the axle ⑨, keeping it in horizontal position.
- 3) Apply half a drop of oil to the axle ⑩ (See Fig. B).
- 4) Mount the LB gear assembly ⑦ onto the axle ⑩ and secure it with the stopper washer ⑥.
- 5) Insert the torsion coil spring (LB) ⑤ into the axle ⑪, then hook it to the mechanism chassis notch ⑫ and to the tab ⑬.
- 6) Mount the TS brake assembly ④ and close the claw ③.
- 7) Apply half a drop of oil to the axle ⑩ (See Fig. D).
- 8) Mount the idler pulley ② onto the axle ⑩, then secure it with the stopper washer ①.
- 9) Mount the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly as described in section 3-15.
- 10) Mount the switch lever assembly as described in section 3-14.
- 11) Mount the DC motor (capstan motor) as described in section 3-3.

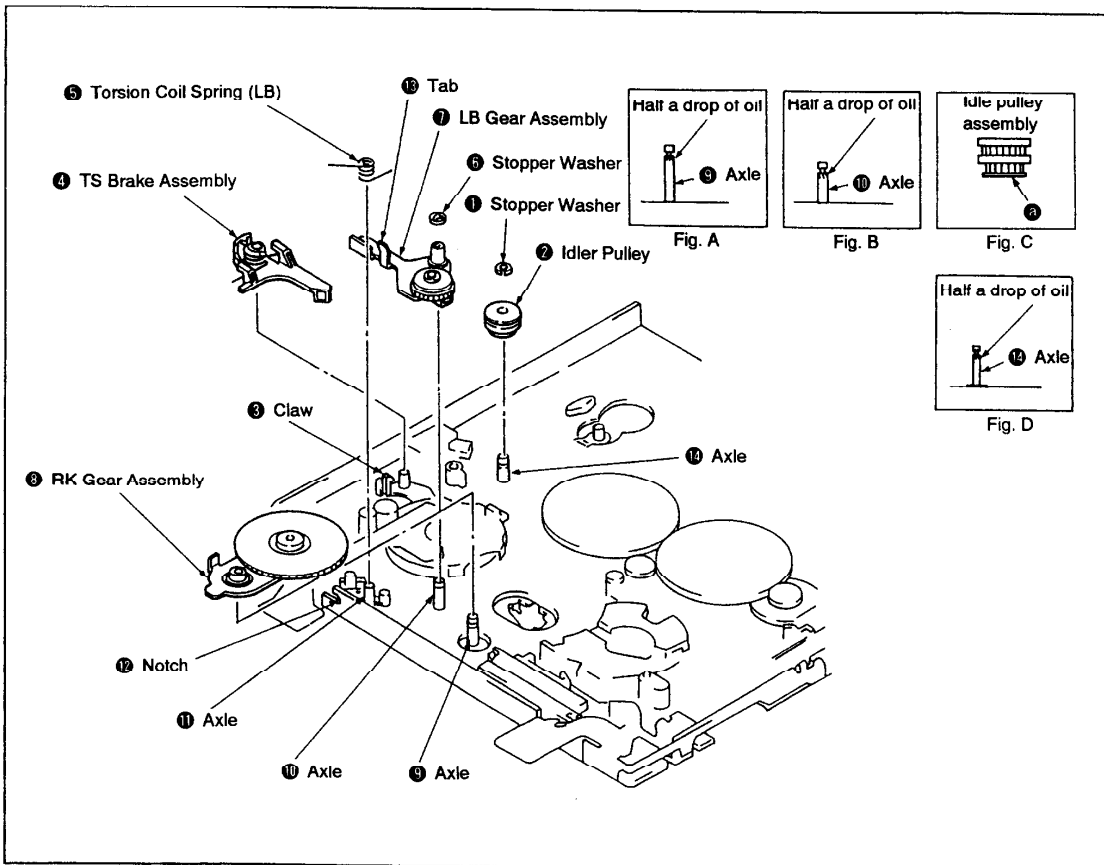


Fig. 3-17.

3-17. UL GEAR, UL BRAKE, UL ARM, LB PLATE SPRING

1. Removal (See Fig. 3-18.)

- 1) Remove the switch lever assembly as described in section 3-14.
- 2) Remove the stopper washer ①, then remove the UL gear ②.
- 3) Remove the UL arm ③, the 1.6 mm-diameter poly washer ④ and the LB plate spring ⑤.
- 4) Remove the UL brake ⑥.

2. Installation (See Fig. 3-18.)

- 1) Mount the UL brake ⑥.
- 2) Apply half a drop of oil to the axle ⑦ (See Fig. A).
- 3) Mount the LB plate spring ⑤ to the axle ⑦ as shown in Fig. B, then install the 1.6mm-diameter poly washer ④.
- 4) Mount the UL arm ③ to the axle ⑦ so that the protrusion ⑧ comes into the groove ⑨ of the UL brake ⑥.
- 5) Mount the UL gear ② to the axle ⑦ and engage it with the gear of the drive gear (left) assembly ⑩.
- 6) Install the stopper washer ①.
- 7) Mount the switch lever assembly as described in section 3-14.

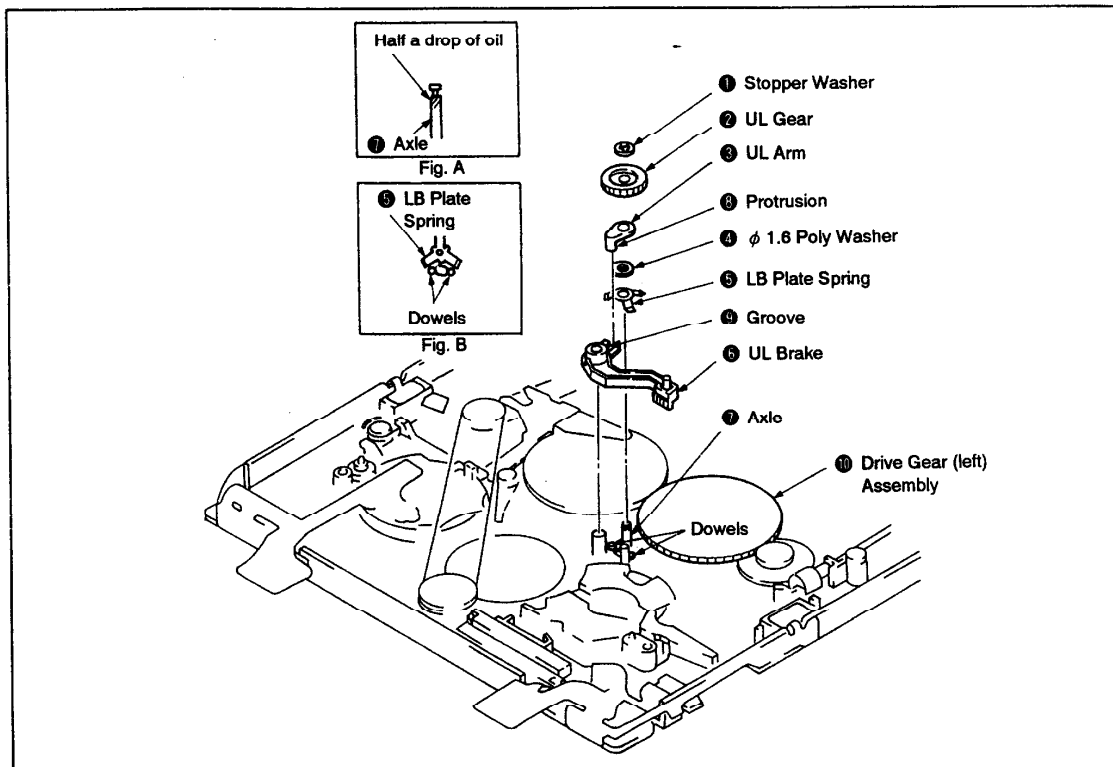


Fig. 3-18.

3-18. COASTER (RIGHT) ASSEMBLY. DRIVE GEAR (RIGHT) ASSEMBLY

1. Removal (See Fig. 3-19.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the drum unit as described in section 3-13.
- 3) Remove the switch lever assembly as described in section 3-14.
- 4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 5) Set the **STOP** mode.
- 6) Remove the screw ①, then remove the coaster plate spring ② and the coaster (right) assembly ③.
- 7) Remove the two screws ④, then remove the reinforcing plate TT ⑤.
- 8) Remove the stopper washer 1.5 ⑥, then remove the drive gear (right) assembly ⑦.

2. Installation (See Fig. 3-19.)

- 1) Grease the points of the mechanism chassis shown in Fig. A.
- 2) Apply half a drop of oil to the axle ⑩ (See Fig. F).
- 3) Grease pin ⑨, axle ⑩ and dowel ⑪ of the coaster (right) assembly ③ (See Fig. D).
- 4) Mount by aligning the pin ⑨ and the axle ⑩ with the slot ⑪ of the mechanism chassis.
- 5) Move the brake release arm ⑫ in the direction of the arrow ⑬ to put it out of the way.

- 6) Mount the drive gear (right) assembly ⑦ to the axle ⑩, and engage it with the drive gear (left) assembly ⑧ as shown in Fig. B.
- 7) Align the ⑨ part with the ⑩ part, and the hole ⑪ with the pin ⑫ of the coaster (right) assembly ③.
- 8) Install the stopper washer 1.5 ⑥.
- 9) Mount by aligning the coaster plate spring ② with the axle ⑩ of the coaster (right) assembly ③ and pin ⑫, then secure with the screw ①.
- 10) Mount the reinforcing plate TT ⑤ aligning it with the dowel ⑪, then tighten the two screws ④ in the indicated order.
- 11) Grease the points indicated in Figs. C and E.
- 12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 13) Mount the switch lever assembly as described in section 3-14.
- 14) Mount the drum unit as described in section 3-13.
- 15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:

- Screw ① should be tightened with a tightening torque of approx. 500g*cm. If tightened too much, the coaster (right) assembly ③ and the coaster plate spring ② will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

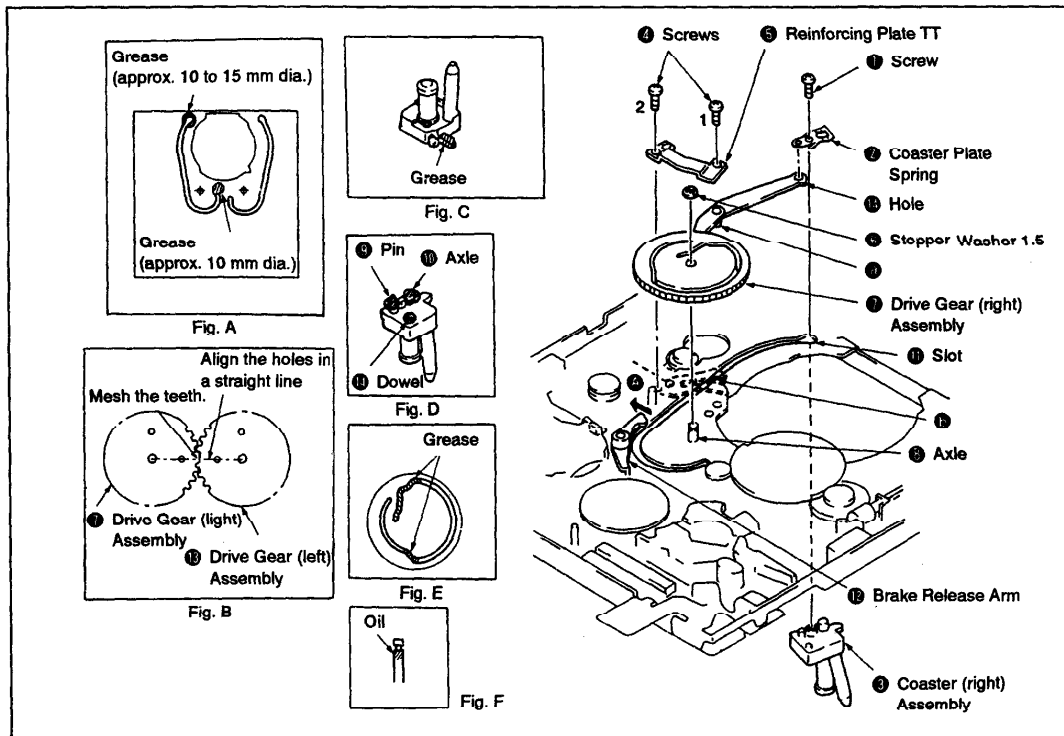


Fig. 3-19.

3-19. COASTER (LEFT) ASSEMBLY, DRIVE GEAR (LEFT) ASSEMBLY

1. Removal (See Fig. 3-20.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the drum assembly as described in section 3-13.
- 3) Remove the switch lever assembly and the pinch roller sub-arm assembly as described in section 3-14.
- 4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 5) Remove the coaster (right) assembly and the drive gear (right) assembly as described in section 3-18.
- 6) Remove the screw ①, then remove the coaster plate spring ② and the coaster (left) assembly ③.
- 7) Remove the two screws ④, then remove the reinforcing plate SS assembly ⑤.
- 8) Remove the stopper washer 1.5 ⑥, then remove the drive gear (left) assembly ⑦.

2. Installation (See Fig. 3-20.)

- 1) Grease the points of the mechanism chassis shown in Fig. A.
- 2) Apply half a drop of oil to the axle ⑩ (See Fig. E).
- 3) Grease pin ④, axle ⑩ and dowel ⑪ of the coaster (left) assembly ③ (See Fig. B).
- 4) Mount by aligning the pin ④ and the axle ⑩ with the slot ⑪ of the mechanism chassis.
- 5) Fit the drive gear (left) assembly ⑦ to the axle ⑩, and mount so that the gear engages with the wheel gear ⑫ and the UL gear ⑬.

- 6) Align the ③ part with the slot ⑪, and the hole ⑭ with the pin ④ of the coaster (left) assembly ③.
- 7) Install the stopper washer 1.5 ⑥.
- 8) Mount by aligning the coaster plate spring ② with the axle ⑩ and pin ④ of the coaster (left) assembly ③, then secure with the screw ①.
- 9) Mount the reinforcing plate SS assembly ⑤ aligning it with the dowel ⑪, then tighten the two screws ④ in the indicated order.
- 10) Grease points indicated in Figs. C and D.
- 11) Mount the coaster (right) assembly and the drive gear (right) assembly as described in section 3-18.
- 12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 13) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
- 14) Mount the drum assembly as described in section 3-13.
- 15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:

- Screw ① should be tightened with a tightening torque of approx. 500g·cm. If tightened too much, the coaster (right) assembly ③ and the coaster plate spring ② will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

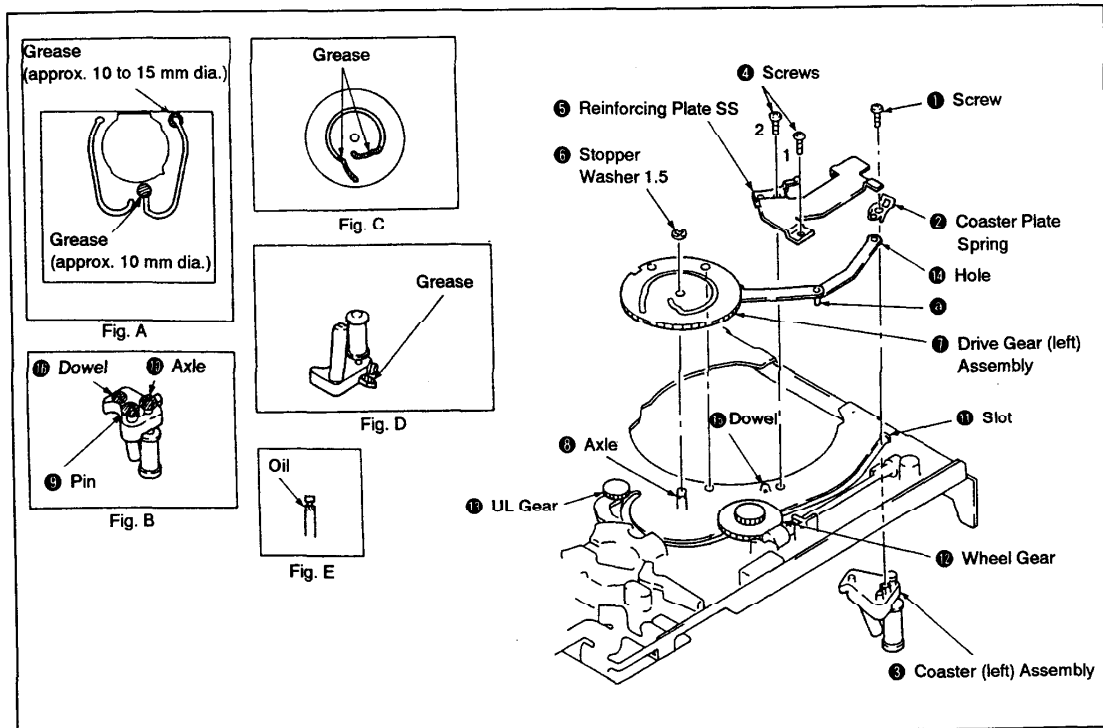


Fig. 3-20.

3-20. LOADING MOTOR, BRAKE RELEASE ARM, WHEEL GEAR, WORM ASSEMBLY

1. Removal (See Fig. 3-21.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
- 3) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 4) Remove the drive gear (right) assembly as described in section 3-18.
- 5) Remove the drive gear (left) assembly as described in section 3-19.
- 6) Remove the two screws ①, then remove the loading motor assembly ②.
- 7) Remove the brake release arm ③.
- 8) Remove the stopper washer ④, then remove the wheel gear ⑤.
- 9) Remove the worm assembly ⑥ from the six claws ⑦.

2. Installation (See Fig. 3-21.)

- 1) Mount the worm assembly ⑥, matching it to the six claws ⑦.
- 2) Grease the shaded parts of the worm assembly ⑥ (five places) (see Fig A).
- 3) Apply half a drop of oil to the axle ⑧ (See Fig. B).
- 4) Fit the wheel gear ⑤ to the axle ⑧ and engage it with the gear of the worm assembly ⑥.
- 5) Mount the brake release arm ③.
- 6) Grease the whole perimeter of the gear of the loading motor assembly ②.
- 7) Align the loading motor assembly ② with the mechanism chassis and secure it with the two screws ①.
- 8) Mount the drive gear (left) assembly as described in section 3-19.
- 9) Mount the drive gear (right) assembly as described in section 3-18.
- 10) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 11) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
- 12) Mount the DC motor (capstan motor) as described in section 3-3.

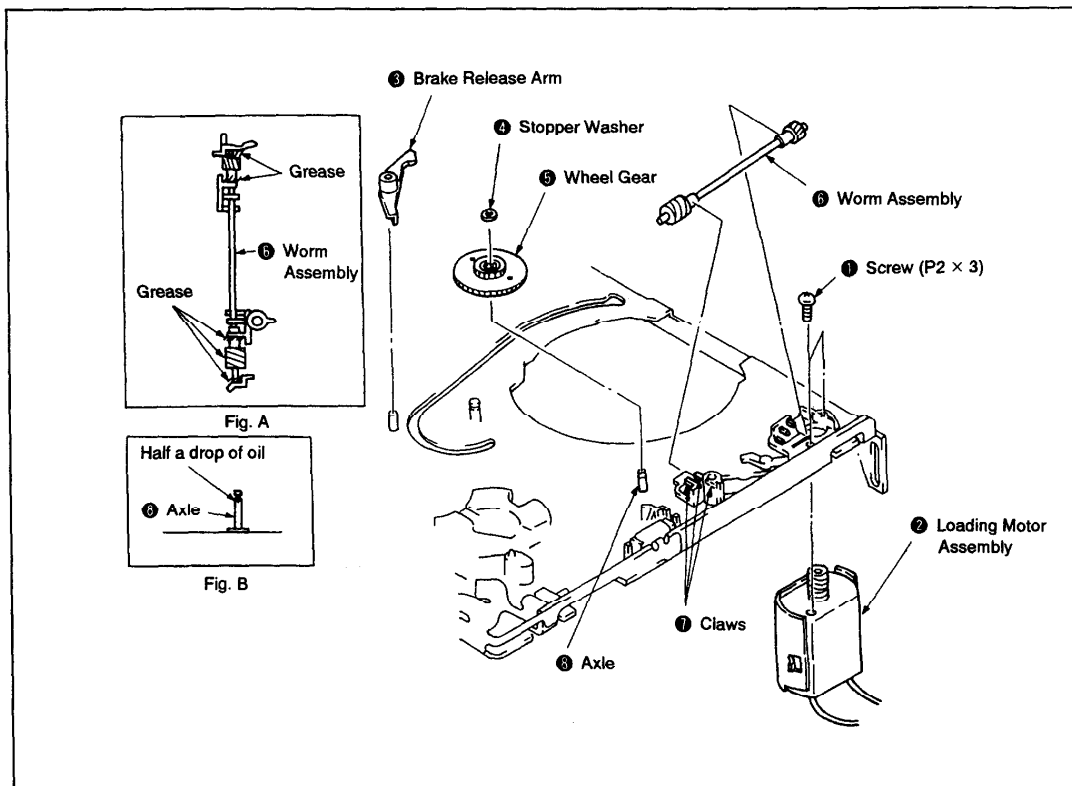


Fig. 3-21.

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removal

- If possible, make a recording before removal.
- 1) Detach the six solderings ①, then use a pair of tweezers or the like to confirm that the terminals passing through the board holes from below can move freely.
- 2) Remove the two screws ② (See Fig. 3-22).
- 3) Mount the jig ④ (Ref. No. J-7) with the two supplied screws ③, then screw the attached hexagon socket screws ⑤ to the jig ④. The rotary upper drum ⑥ will move upward and come off (See Fig. 3-23).

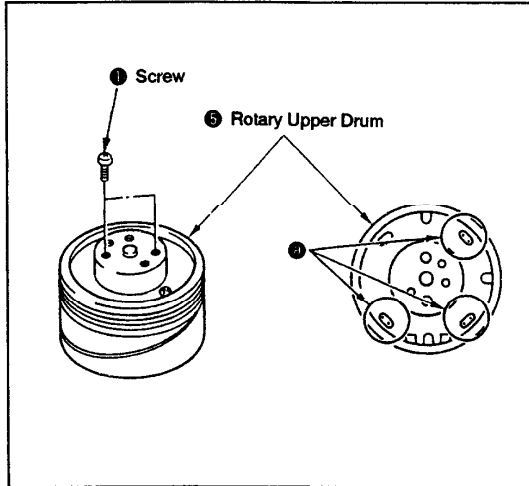


Fig. 3-22.

2. Installation

- 1) Wipe clean the flange surface and the rotary upper drum ⑤ surface that makes contact with it, and confirm that they are free from dirt and scratches.
 - 2) Insert the jig ⑦ (Ref. No. J-7) into the drum positioning hole ⑥, then set the rotary upper drum ⑤ by passing the jig through its positioning hole ⑥.
- Note:** Confirm that the terminals ⑧ protrude slightly from the rotary upper drum board holes (See Fig. 3-24).
- 3) Remove the jig ⑦ and push down the rotary upper drum ⑤ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two hexagon socket screws ① alternately.
 - 4) Insert the jig ⑦ into the positioning hole ⑥ again and confirm that it goes in smoothly. If it does not, loosen the two screws ①, repeat step 3 of the Removal paragraph and restart the setting procedure.
 - 5) Tighten the screws ①.
 - 6) Solder the terminals ⑧ (② in Fig. 3-22).

Note: Take care that no solder flows below the board.

Note: After installing, be sure to perform tape path adjustment as described in section 4.

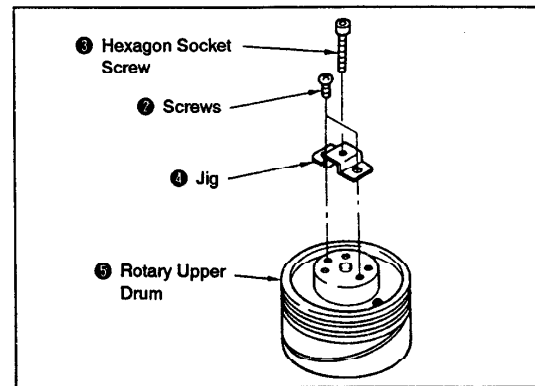


Fig. 3-23.

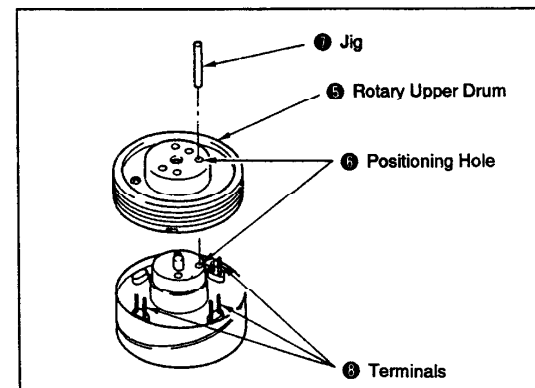


Fig. 3-24.

3-22. FWD BACK TENSION (See Fig. 3-25.)

- 1) Set the torque cassette (Ref. No. J-6).
- 2) Set the FWD mode and confirm that S reel table torque value is within 9 to 13 g*cm.
- 3) If the torque value does not meet the specification, adjust the adjust arm ①.

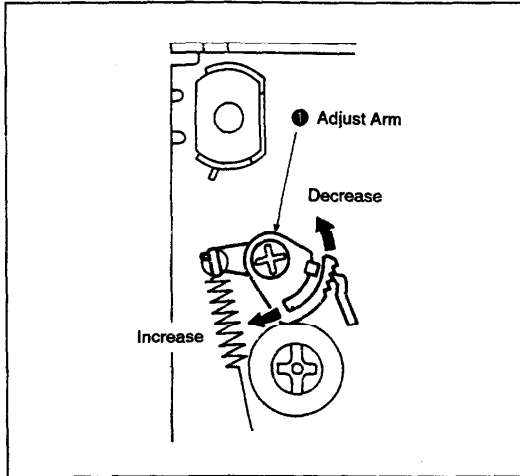


Fig. 3-25.

3-23. REEL TORQUE CHECK

- 1) Set the torque cassette.
- 2) Set the FWD mode and confirm that T reel table torque value is within 7 to 15 g*cm.
- 3) Set the REV mode and confirm that S reel table torque value is within 29 ± 6 g*cm.
- 4) Set the REV mode and confirm that T reel table torque value is within 13 to 25 g*cm.
- 5) If a torque value does not meet the specifications above, replace the corresponding reel table.

4. TAPE PATH ADJUSTMENT

[The Track Shift Mode]

In the 8 mm video system, instantaneous tape speed control is performed using four kinds of pilot signals, and high-precision tracking is achieved through the ATF (Automatic Track Finding) system. This makes a tracking control knob unnecessary and allows for precise tracing.

On the other hand, however, tape path adjustment presents some difficulties when the ATF system is used. Namely, since the ATF system will automatically compensate to some degree for head tracing errors, thorough adjustment is not possible.

This can be solved by setting the track shift mode for tracking fine adjustment. ATF will be compulsorily activated, shifting the tracking amount by a fixed amount (approx. 1/4) and thus making tracking fine adjustment easy. Furthermore, no track shift jigs are required.

4-1. TRACK SHIFT MODE SETTING

[Setting Procedure]

- Connect the TEST A and TEST B terminals to the COM terminal.

Example:

NTSC GV-8

PAL GV-8E

Connect Pins ① and pin ③ of CN017 on the
{ SV-34 board (GV-8) } to pin ② of it. (See Fig. 4-1)

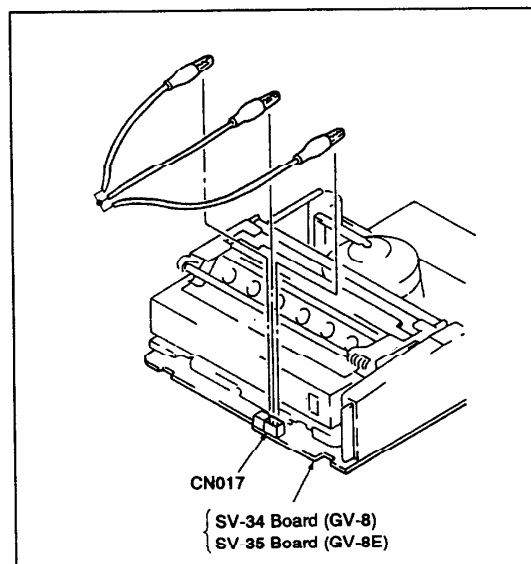


Fig. 4-1.

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig. 4-2).

Therefore, when performing section 4-6. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-5), modified as follows, and perform adjustment in playback mode.

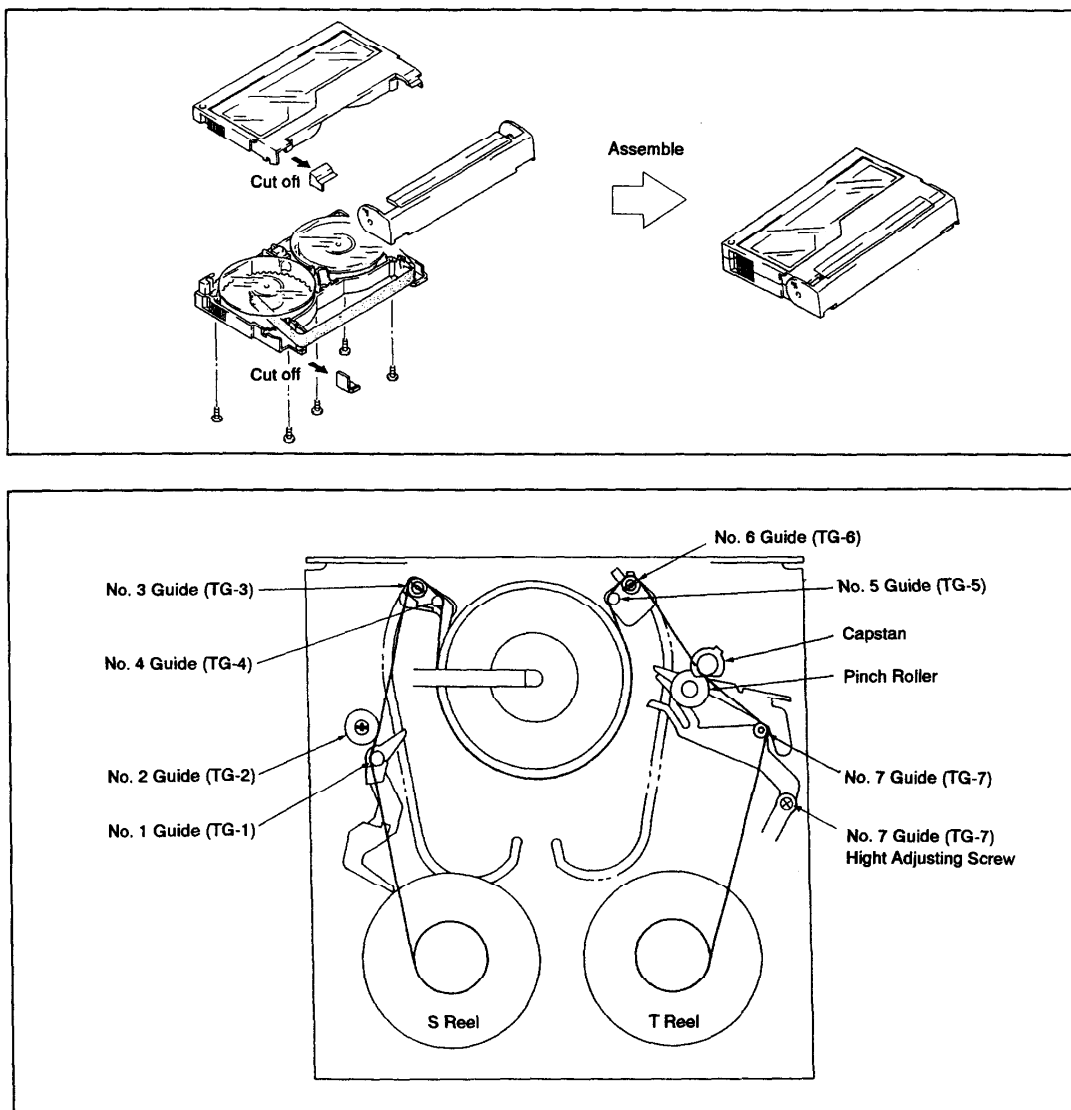


Fig. 4-2.

4-2. PREPARATIONS FOR ADJUSTMENT

- 1) Clean tape path surfaces (tape guides, drum, capstan shaft, pinch roller) (See Fig. 4-2).
- 2) Connection of oscilloscope and output method of waveform.

CH 1: RF signal output of the drum head (V RF OUT)

Method for signal output:

Short-circuit the external trigger output (RF SW. P) and GND.

Example:

NTSC GV-8

PAI GV-8E

CH 1: Pin ③ (V RF OUT) of CN018 on the

{ SV-34 board (GV-8)

{ SV-35 board (GV-8E)

Method for signal output:

Short-circuit pin ① (GND) and pin ② (RF SW.P) of CN018 on the

{ SV-34 board (GV-8)

{ SV-35 board (GV-8E)

- 3) Play back the alignment tape for tracking adjustment (Ref. No. J-5).
- 4) Confirm that both the entrance and exit side RF waveforms of the oscilloscope are flat (See Fig. 4-4). If they are not, adjust as follows.

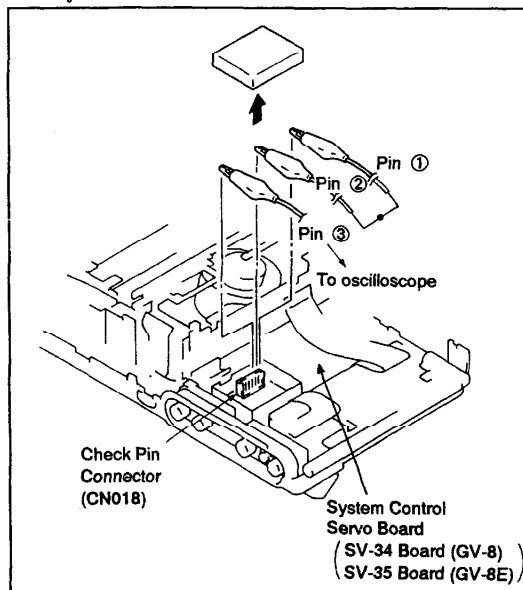


Fig. 4-3.

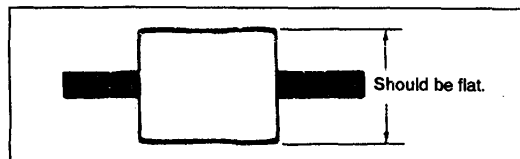


Fig. 4-4.

4-3. TRACKING ADJUSTMENT (See Fig. 4-5.)

- 1) Play back the alignment tape for tracking adjustment.
- 2) Pass a hexagonal wrench, screwdriver (Ref. No. J-11) or the like through the hole ①, loosen the lock screw ② a little, then make the entrance side waveform flat by turning the No. 3 guide (TG-3) ③.
- 3) Pass a hexagonal wrench, screwdriver or the like through the hole ④, loosen the lock screw ⑤ a little, then make the exit side waveform flat by turning the No. 6 guide (TG-6) ⑥.

Note: Take care not to loosen lock screws too much, since guides come loose easily.

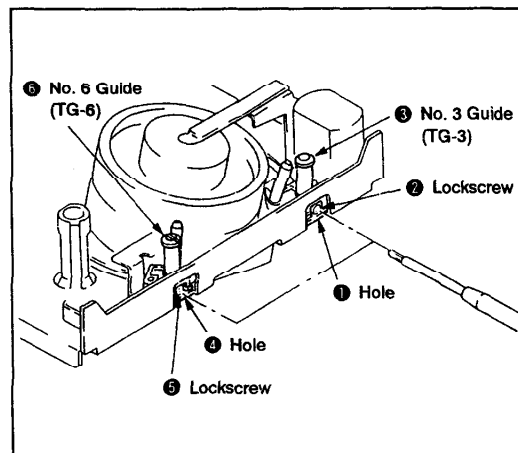


Fig. 4-5.

4-4. TRACKING FINE ADJUSTMENT (See Figs. 4-5. and 4-6.)

- 1) Play back the alignment tape for tracking adjustment and set the track shift mode.
- 2) Confirm whether the waveform is flat. If it is not, turn the No. 3 (TG-3) and No. 6 (TG-6) guides so that it becomes flat.
- 3) Fix the No. 3 guide ③ by tightening its lock screw ②. Then confirm that the entrance side waveform has not changed.
- 4) Fix the No. 6 guide ⑥ by tightening its lock screw ⑤. Then confirm that the exit side waveform has not changed.

Note: The set screws ② and ⑤ should be tightened with a tightening torque of approx. 200g·cm $\pm$ 10%.
If tightened too much, there is danger of damaging the thread.

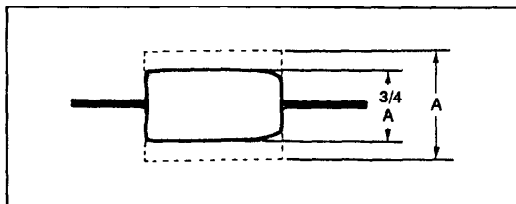


Fig. 4-6.

4-5. No. 2 GUIDE (TG-2) ADJUSTMENT

When the No. 2 guide has been turned or replaced, perform height presetting before this adjustment.

4-5-1. No. 2 Guide (TG-2) Height Presetting (See Fig. 4-7.)

- 1) Adjust the height from the mechanism chassis upper surface to the TG-2 upper flange ① upper surface to 18.6 mm by rotating the TG-2 upper flange ①.

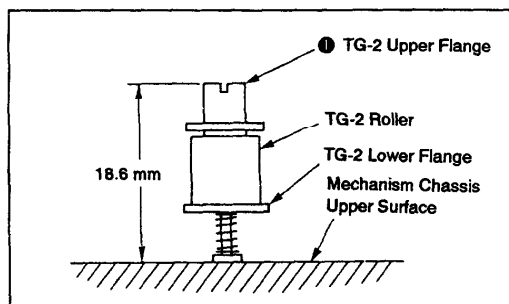


Fig. 4-7.

[Reference]

This U mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7). To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Counterclockwise
	Lower	Clockwise

4-5-2. No. 2 Guide (TG-2) Adjustment (See Figs. 4-8. and 4-9.)

- 1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
 - 2) Confirm that the tape is not bent at the lower flange ② of the No. 2 guide (TG-2) ① (See Fig. 4-8). If it is, turn the upper flange ③ of the No. 2 guide (TG-2) ① clockwise with a screwdriver, lowering it until the tape is straightened.
 - 3) Play back the alignment tape for tracking adjustment.
 - 4) Perform tracking adjustment and tracking fine adjustment as described in sections 4-3. and 4-4.
 - 5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
 - 6) If the waveform is not normal (See Fig. 4-9), turn the upper flange ③ of the No. 2 guide (TG-2) ① 90° counter-clockwise and repeat step 5.
- Repeat steps 5 and 6 until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step 5.

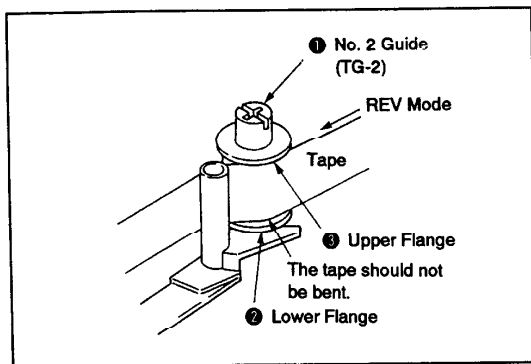


Fig. 4-8.

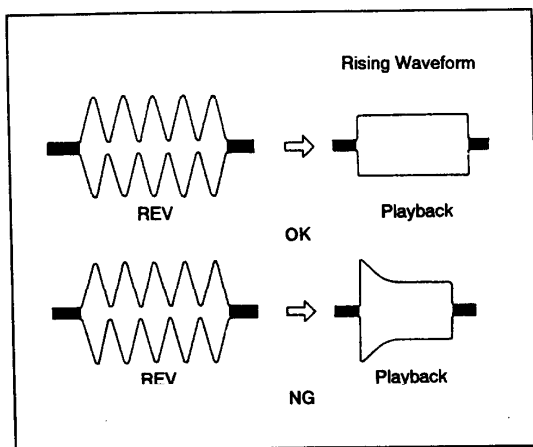


Fig. 4-9.

4-6. No. 7 GUIDE (TG-7) ADJUSTMENT (See Fig. 4-10.)

- 1) Play back the alignment tape for tracking adjustment and set the REV mode.
- 2) Confirm that the tape is not bent between the No. 6 guide (TG-6) ① and the capstan ②. If it is, turn the height adjusting screw ④ of the No. 7 guide (TG-7) ③ until the tape is straightened.
- 3) Set the playback mode again and confirm that the tape is not bent between the capstan ② and the height adjusting screw ④ of the No. 7 guide (specification: 0.5 mm or less). If the tape is bent beyond the specification, turn the No. 7 guide (TG-7) ③ until bending is within the specification (0.5 mm). If in the REV mode tape bending between the No. 6 guide (TG-6) ① and the capstan ② is 0.3 mm or less, adjustment can be considered completed.

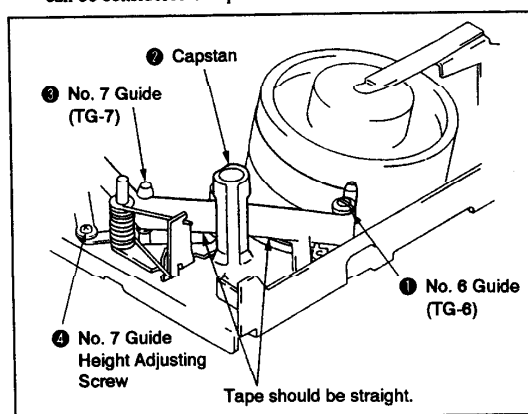


Fig. 4-10.

4-7. CUE AND REV WAVEFORM CHECK (See Fig. 4-11.)

- 1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (See Fig. 4-11). In case pitch is not constant, perform section 4-4. Tracking Fine Adjustment and section 4-6. No. 7 Guide Adjustment.
- 2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (See Fig. 4-11). Otherwise, perform section 4-4. Tracking Fine Adjustment.

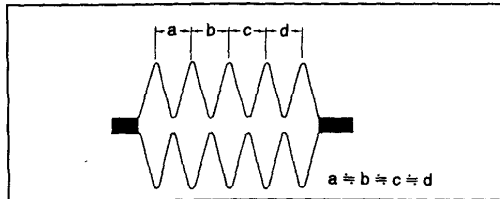


Fig. 4-11.

4-8. CHECK AFTER ADJUSTMENT

4-8-1. Tracking Check

- 1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (See Fig. 4-12).
- 2) Then, confirm that the minimum amplitude value (EMIN) is 65% of the maximum value (EMAX) or larger (See Fig. 4-13).
- 3) Confirm that no large fluctuations occur on the waveform (See Fig. 4-14).

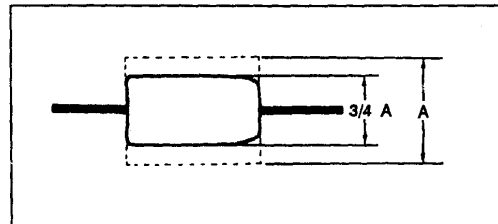


Fig. 4-12.

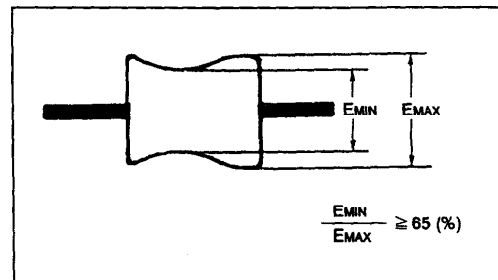


Fig. 4-13.

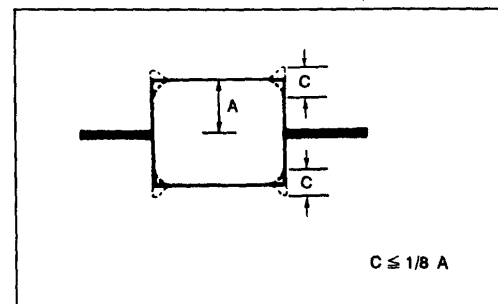


Fig. 4-14.

4-8-2. Rising Check (See Fig. 4-15.)

- 1) Play back the alignment tape for tracking adjustment.
- 2) Cancel the track shift mode.
- 3) Eject the tape, then load it again.
- 4) Set the playback mode and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller (See Fig. 4-15).
- 5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
- 6) Repeat steps 3) to 5) once more.

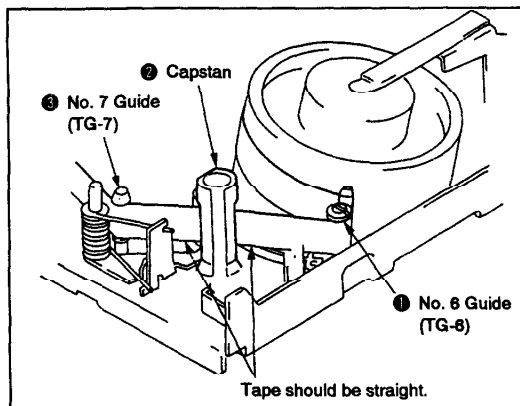


Fig. 4-15.

4-8-3. Tape Path Check (See Fig. 4-16.)

- 1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3 mm, at the lower flange of the No. 2 guide, the upper flange of the No. 3 guide, the upper flange of the No. 6 guide and the No. 7 guide upper and lower flanges.
- 2) Confirm that no tape rising occurs and that curling is less than 0.3 mm at the flanges of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

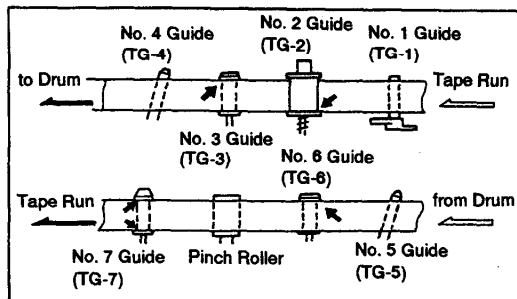


Fig. 4-16.